



Consulting Assistance on Economic Reform II

Discussion Papers

The objectives of the Consulting Assistance on Economic Reform (CAER II) project are to contribute to broad-based and sustainable economic growth and to improve the policy reform content of USAID assistance activities that aim to strengthen markets in recipient countries. Services are provided by the Harvard Institute for International Development (HIID) and its subcontractors. It is funded by the U.S. Agency for International Development, Bureau for Global Programs, Field Support and Research, Center for Economic Growth and Agricultural Development, Office of Emerging Markets through Contracts PCE-C-00-95-00015-00 and PCE-Q-00-95-00016-00. This paper was funded by contract PCE-C-00-95-00015-00, Task Order No. 42 Copyright 2000 by the President and Fellows of Harvard College.

The Impact on Economic Growth in Africa of Rising Costs and Labor Productivity Losses Associated with HIV/AIDS

Malcolm F. McPherson
Deborah Hoover
Donald R. Snodgrass



CAER II Discussion Paper No. 79
August 2000

The views and interpretations in these papers are those of the authors and should not be attributed to the Agency for International Development, the Harvard Institute for International Development, or CAER II subcontractors.

For information contact:

CAER II Project Office
Harvard Institute for International Development
14 Story Street
Cambridge, MA 02138 USA
Tel: (617) 495-9776; Fax: (617) 495-0527
Email: caer@hiid.harvard.edu

**The Impact on Economic Growth in Africa of Rising Costs and
Labor Productivity Losses Associated with HIV/AIDS**

Malcolm F. McPherson*

in association with

Deborah A. Hoover and Donald R. Snodgrass

Final revision: 16th August, 00

John F. Kennedy School of Government
Harvard University
Cambridge, Massachusetts

- We are grateful to Clive Gray of Harvard University and Orest Koropeczky of USAID for helpful comments on our earlier drafts.
We thank Seth Kirschenbaum for editorial assistance.

Executive Summary

Conventional models explaining the impact of HIV/AIDS on economic growth typically present projections based on scenarios computed ‘with AIDS’ and ‘without AIDS.’ When the disease was in its early stages, that approach was a reasonable “first cut.” However, with HIV/AIDS now an epidemic in many African countries, such comparisons are no longer valid. The impact of the disease cannot be treated as an ‘exogenous’ influence that can be ‘tacked on’ to models derived on the presumption that the work force is HIV-free. HIV/AIDS has become an ‘endogenous’ influence on most African countries that has adversely affected their potential for growth and development. In some cases, such as Zambia, Zimbabwe, and the region covering the former Zaire, the spread of HIV/AIDS may have already undermined their ability to recover economically.

This paper analyzes the impact of HIV/AIDS using a model of economic retrogression. Derived from reversing direction in an endogenous growth framework, the model provides a fresh perspective of the impact of HIV/AIDS on economic growth. Many analysts have now recognized that their best estimates of the effect of the epidemic have been systematically understated. What they have failed to fully account for is that the HIV/AIDS epidemic has been having a non-linear effect on economic growth. Our model incorporates this element by including the feedback to the rate of economic growth of declining savings and investment due to rising costs and falling productivity associated with HIV/AIDS.

The paper concludes with recommendations designed to assist the most seriously affected countries to begin looking beyond the HIV/AIDS epidemic. First, governments and donor agencies working in Africa should devise programs and responses that deal constructively with individuals who are HIV-positive. The challenge is to understand how large segments of the population, who know they will die prematurely, can be trained, managed, and motivated in ways that maintain (or, at least, do not undermine) productivity. Second, donor agencies and African governments need to devise broad-based programs of technical assistance specifically to stabilize the operations of the key social and economic organizations. Third, governments should work with employers to ensure that efforts to minimize the private costs of HIV/AIDS do not generate unacceptable social costs. Fourth, African governments need to rid themselves of all activities that do not contribute to the immediate tasks of promoting economic growth and development. The spread of HIV/AIDS has progressively undercut the capacity of African states. This requires a sharp scaling back of government activities. For their part, donors should ensure that the measures they promote, such as “comprehensive development frameworks,” “poverty reduction and growth strategies,” and “country strategies,” do not place unsustainable demands on over-stretched and (often) dwindling state capacity. Finally, as a general matter, no African country can hope to recover economically (even if HIV/AIDS has not yet become a major problem) if the pattern of economic mismanagement and start-stop approach to economic reform continues. Such mismanagement and halting reform wastes resources and further undermines the capacity for growth and development.

Bios

Malcolm F. McPherson, formerly a Fellow of the Harvard Institute for International Development, is now a research fellow at the Belfer Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University. He is senior advisor on the Equity and Growth through Economic Research (EAGER) Project and principal investigator for the study “Restarting and Sustaining Growth and Development in Africa.” He holds a Ph.D. in Economics from Harvard University.

Deborah A. Hoover is an independent consultant who served as the Training Officer and Administrator on HIID’s Macroeconomic Technical Assistance Project in the Ministry of Finance in Zambia. Ms. Hoover has undertaken extensive research on the problems of training under conditions of economic and social stress and of devising methods to motivate individuals who work on their own account and in large organizations.

Donald R. Snodgrass is an Institute Fellow *emeritus* of the Harvard Institute for International Development. Trained as a labor economist, he holds a Ph.D. from Yale University. He is the author of several books and numerous articles. With Malcolm Gillis, Dwight Perkins and Michael Roemer, he is the author of *Economics of Development* (Norton), which is currently being revised for its fifth edition.

Table of Contents

Executive Summary	2
Bios	3
Introduction	5
1. Background to the Study	6
2. A Conceptual Framework	10
a. A Model of Retrogression	10
b. HIV/AIDS and Retrogression	11
3. Testing the Model	18
a. Some Preliminary Results	18
b. Developing a Full-Scale Model	20
4. Concluding Comments	23
Annex A: Work Place Interventions in Response to HIV/AIDS in Africa (by Deborah Hoover)	25
Annex B: Framework for Thinking About Work Place Interventions in Response to HIV/AIDS in Southern Africa (by Donald Snodgrass)	43
Annex C: HIV/AIDS and Economic Growth: Econometric Results from Zambia (by Malcolm McPherson and Tzvetana Rakovski)	48
References	54
Endnotes	58

List of Tables

Sub-Saharan Africa: Selected Macroeconomic Indicators, 1970-1998
Sub-Saharan Africa excluding South African and Nigeria: Selected Macroeconomic Indicators, 1970-1998

Introduction

At a public lecture at Harvard University in 1999, Dr. Peter Piot, Director of UNAIDS, made an interesting comment. He noted that despite having worked on HIV/AIDS for most of the last two decades, he continues to be surprised by the inaccuracy of predictions about the course of the epidemic, including those that he, himself, has made.¹ Dr. Piot singled out the extent to which the economic and social impacts of the disease have been understated.

Our paper builds on this point. We argue that, with respect to the economic impact of HIV/AIDS in Sub-Saharan Africa (henceforth Africa), the dynamics of the disease have been widely misperceived. Important economic thresholds have been crossed as the epidemic has intensified. There are at least three reasons for these misperceptions.

One. The conceptual model commonly used to trace the dynamic effects of HIV/AIDS on economic growth is seriously flawed. The most common projection models are linear in growth rates.² Emerging evidence suggests that they should be curvilinear with growth rates declining at an increasing rate as the epidemic intensifies.³

Two. The main official responses to the epidemic so far have been focused on prevention and cure. Generally overlooked have been the tasks of training, managing, motivating, and otherwise constructively engaging the large numbers of people who are HIV-positive and whose productive lives are being prematurely shortened.⁴ Because of this bias, maintaining labor productivity has become increasingly difficult. We argue that without a special effort to raise (or maintain) the productivity of those who are HIV-positive, economic growth cannot be maintained let alone increased.

Three. The full implications for economic recovery and subsequent growth and development of the loss of skills and erosion of institutions across Africa remain largely unrecognized.⁵ With the exception of Botswana (where the prevalence of HIV/AIDS is high) and Mauritius (where it is not) all other African countries (including South Africa) have been engaged in efforts to reverse years of economic stagnation and decline. Though some analysts had claimed that Africa was “on the move,”⁶ economic reform was eluding most African countries even before HIV/AIDS began decimating their work forces and eroding the performance of their major organizations. Indeed, a case can be made that the cumulative losses due to HIV/AIDS are preventing recovery in some countries. For countries, such as Zambia, Zimbabwe, Uganda, and Malawi where a high proportion of the adult population is HIV-positive⁷, barriers to reform and future growth may already exist that are not fully understood.⁸

The paper is organized as follows. Section 2 provides background material on the issues being examined. Section 3 sketches a conceptual approach for examining the dynamic impact of HIV/AIDS on economic growth. The model is derived from theoretical work on economic retrogression that involves “running in reverse” an endogenous growth model. The spread of HIV/AIDS reduces national savings and investment. The ensuing (endogenous) reduction in the growth of productive capacity systematically undermines

economic growth and development. Section 4 indicates how such a model might be tested. The final section has concluding comments.

The paper has three annexes. Annex A, by Deborah Hoover, is a review of the literature of work place responses to HIV/AIDS in Southern Africa. Annex B, by Donald Snodgrass, examines the influence of HIV/AIDS on labor productivity. Annex C, by Malcolm McPherson and Tzvetana Rakovski, reports econometric evidence using Zambian data on the non-linear growth effect due to the intensification for the HIV/AIDS epidemic. As such it offers a test of the theoretical approach developed in the text.

1. Background to the Study

The literature on HIV/AIDS is truly enormous.⁹ Two aspects of that literature concern us here, namely the economic impact of HIV/AIDS in Africa¹⁰ and the implications of HIV/AIDS for public policy.¹¹

Analyses of the costs of HIV/AIDS have focused primarily on the impact on the labor force, the family, the education system, and national economies. A major area of emphasis has been the rising costs due to the progressive debilitation and loss of workers. These studies highlight other negative effects including: the impact on organizations (public and private) associated with the added cost of training replacement workers, higher wage bills as additional staff are retained to compensate for absenteeism and worker debility, the costs incurred when work schedules are disrupted, the increase in employer provided health and medical costs, and the unanticipated depletion of pension and insurance funds.¹² The early literature suggested that these costs were small. More recent contributions are showing that these costs are rising rapidly. The implication is that both the rate of economic growth and the prospects for future growth have been compromised.¹³

Since the losses from HIV/AIDS are cumulative and data on the effects of the impact of the epidemic are unreliable (see Annex A), the overall impact of HIV/AIDS on the labor force has been subject to considerable uncertainty.¹⁴ As noted in the discussion below, an important source of that uncertainty has arisen because analysts have tended to ignore critical aspects of the underlying dynamics when calculating the costs of HIV/AIDS. A major focus in the literature has been work place prevention. Far less attention has been given to the types of behavioral, social, and structural changes needed within the work place to prevent productivity and growth from falling.¹⁵

This has occurred despite important efforts to identify and advertise “best practices” for dealing with HIV/AIDS.¹⁶ As Annex A shows, such practices have not been widely used. The reality is that, for many organizations and enterprises (and one might argue most of the countries of Southern Africa), the epidemic has elicited few constructive responses let alone the adoption of “best practices.” Indeed, a major gap in the research (and practice) has been how to deal with a large and growing number of workers who know (or suspect) that their lives are being dramatically foreshortened.

Under conditions of high AIDS prevalence, as in Africa, conventional approaches to training, managing, organizing, and motivating workers need to be fundamentally re-thought.¹⁷ There is little to suggest that HIV-positive trainees or workers should respond (or can be expected to respond) in the same way as those with a “normal” life expectancy. Moreover, the prospect of large losses of skilled workers from HIV/AIDS makes the value of long-term degree-based training problematic. One question that has not been answered is whether donor agencies are prepared to continue supporting long-term training in the face of rising attrition rates?

For employers, a key issue is the type of (cost-effective) incentives they can devise to induce HIV-positive workers to maintain their productivity. Faced with high and rising incidence of HIV/AIDS, no one should be surprised that employers (alone and collectively) are taking measures (often draconian) to contain their costs.¹⁸

One of the purposes of the review in Annex A is to show how organizations and businesses have sought to maintain productivity (and profitability) when significant numbers of workers will become debilitated and die. Such measures include the “externalization” of costs, the use of expatriate labor, and forced retirement of infected workers. These measures often reflect attempts by employers to shift the costs of HIV/AIDS onto the infected worker’s family or onto society at large. Such practices will undoubtedly continue. Nonetheless, it should be recognized that employers are constrained in their ability to shift these costs. Some employers can succeed in the short-run. But, as the HIV/AIDS epidemic intensifies, the macroeconomic effects of these rising costs will feedback to affect the employers’ output, sales, taxes, or access to social services.¹⁹

Cost shifting is a defensive strategy. What has not been widely considered is how to take a more constructive approach. Such an approach will emerge as managers begin to grapple with the following questions. How they can continue managing their operations effectively and efficiently when the incidence of HIV/AIDS is high and rising? This matter becomes increasingly complicated when the managers themselves are HIV-positive or suspect that they are. What institutional or organizational changes (to goals, workflow, or operational procedures) will enable productivity to be maintained? What actions will help counteract the lack of motivation, low morale, and counterproductive behavior (pilfering, absenteeism, asset stripping) that progressively encumbers an organization as more staff become debilitated and die? Finally, what measures can be taken *now* so that, when countries eventually begin to move beyond the HIV/AIDS epidemic, the damage to personal and social relations and economic growth is not irreparable?

The above questions have a common theme. They relate to the organizational, social, and economic dynamics of situations where a large (and increasing) number of productive lives are being dramatically shortened. This, we argue, is the context in which the impact of HIV/AIDS on economic growth (and development) has to be understood.

That context is missing from most analyses of the effect of HIV/AIDS on economic growth. The most common approach has been for analysts to provide a model of what they believe is the present structure of an economy. Then, based on their best estimates of trends in the incidence of HIV/AIDS, they derive alternative growth paths reflecting situations ‘with’ and ‘without’ HIV/AIDS. Kambou, Devarajan and Over, in one of the earliest examples of this approach, studied the impact of HIV/AIDS in Cameroon.²⁰ Using a Computable General Equilibrium (CGE) model, they derived two sets of projections. The first was a base case that abstracted from the effects of HIV/AIDS. The second allows for those effects. They did that by reducing the supply of labor by an estimate of what the losses to HIV/AIDS were expected to be over the projection period.

The results derived by Kambou, Devarajan and Over (and those of other studies cited below) underscore Dr. Piot’s observation noted earlier. Subsequent evidence has shown that their projections grossly understated the effect of the epidemic on Cameroon and, by extension, other African countries.

There are several reasons for this, but two stand out. First, Kambou *et al.* could not have foreseen that new, virulent sub-types of the disease would emerge.²¹ Second, using a CGE model to derive the alternative scenarios, ‘with’ and ‘without’ AIDS, is inappropriate. As the HIV/AIDS epidemic has intensified, economies have experienced substantial structural change.²² This does not get adequately reflected in CGE models (or other fixed coefficient models) upon which the ‘with AIDS’ scenario was based.²³ Kambou *et al.* (and other analysts who have followed their lead) did not modify their basic model to reflect these changes.²⁴

When their research was undertaken (1990), such an approach could be defended as a “rough first cut.” At that time, the spread of HIV/AIDS was just beginning to accelerate. What cannot be defended, however, was the continued use of such comparative scenarios. This point, however, has not been widely appreciated. For example, the *Sunday Times* in South Africa reported that in mid-1997 the impact of the HIV/AIDS epidemic in 2005 would be to reduce overall growth rates of the economy by 1 percent per annum.²⁵ This projection has startling implications. It means that, with more than 20 percent of the adult population infected with HIV and likely to die within five years, the impact on South Africa’s economic growth is expected to be incidental. Clearly, something is amiss.

Projection errors like these would be significantly less consequential if officials and the general public across Africa were more forthcoming about the extent of the epidemic. Indeed, with very few exceptions, the official and private response has been denial.²⁶ Events, however, may be changing that. During the last week of May 2000, viewers of Cable News Network around the world saw Thabo Mbeki, President of South Africa, at the time on a visit to the United States, attempting to justify his reluctance to face the reality of HIV/AIDS in his country.²⁷ Whether Mbeki has come to grips with the problems South Africa is facing or not, others have. The theme of the Durban conference in July 2000 was “breaking the silence.” Mbeki gave a keynote speech. His predecessor, Nelson Mandela, whose tenure was notable for its absence of any serious effort to

confront the issue, has at last noted that history will judge harshly those who sit idly by. History so far has shown that until mid-2000, both Mandela and Mbeki ducked the issue. In the interim, South Africa (and Southern Africa in general) has borne a terrible cost. Millions of people have died and millions more will die because of their leaders' silence and/or ambivalence.²⁸ Their inaction or, at best, lukewarm response has killed large numbers of their own citizens.²⁹

Unfortunately, there is nothing new about denial and limited recollections of (traumatic) events. History has many examples of societies and groups that exhibit such behavior. Wars and organized mayhem have been particularly fertile periods for generating selective social amnesia. Yet, in most cases, the denial relates to *events*. By contrast, the HIV epidemic is a *process*. Rather than dulling its impact, denial allows the epidemic to intensify.³⁰

Scholars and practitioners dealing with HIV/AIDS on a day-to-day basis understand the folly of denial. Yet, there are many reasons why it has persisted. For example, as noted in Annex A, governments were reluctant to openly deal with HIV/AIDS because officials argued it would adversely affect tourism and foreign investment. Others have boxed themselves in by years of silence or cant. African journalists, for example, who failed to write candidly about the disease, and leaders who avoided the issue, face a dilemma. President Chiluba of Zambia provides an example. Though the conference was held in Lusaka, Chiluba failed to attend the "International Conference on AIDS and Sexually Transmitted Diseases in Africa" in September 1999. From his inauguration as president until the time of that conference, more than 500,000 Zambian children have become AIDS orphans.³¹ Attending the conference risked advertising his lack of attention to the toll HIV/AIDS has had and was having on the citizens whose welfare he had sworn to protect. Though his absence from the conference received little attention in Zambia (where observers understood it was consistent with his past behavior), the foreign press took note.³²

Donor agencies, too, have been caught in a web of denial. Although they generously support work by health ministries on prevention and treatment of HIV/AIDS, most donor agencies have failed to scale back their "development" agendas in line with the erosion of skills and institutional capacity in Africa as a result of HIV/AIDS. For example, both the World Bank and the International Monetary Fund have proceeded with their sector investment programs, comprehensive development frameworks, poverty reduction and growth strategies, as though the capacities of African governments remained unimpaired.³³ This directly contradicts the message the World Bank conveyed in its 1999 study *Confronting AIDS*. That study made referred to the *World Development Report* of 1997 where it was suggested that developing countries should ensure their development programs were consistent with "State capacity."³⁴

African countries themselves have compounded these problems. Though they lack the relevant capacity to implement the donor-driven agendas, their key policy makers continue to accede to the various World Bank, IMF (and other donor) "initiatives." The

(predictable) result has been that most donor-supported adjustment programs are pre-programmed to fail.³⁵

The above examples could be multiplied as the material in Annex A shows. The implication is that our basic conceptual models for dealing with the impact of HIV/AIDS are flawed. Understanding the social and behavioral dimensions of the HIV/AIDS requires that we correct these flaws. The model presented below is one option for doing that.

2. A Conceptual Framework

a. A Model of Retrogression

The basic framework adopted here for thinking about the dynamic impact of HIV/AIDS on economic growth draws on models of economic retrogression. These models were developed in the early 1990s³⁶ to examine the effects of rising levels of corruption and inefficiency on the growth paths of developing countries. The objective was to explain why a large number of countries in Africa had been exhibiting “patterns of growth” that did not conform to the (so-called) “normal” time paths derived by Kuznets and Chenery and his colleagues.³⁷ Economic regression became so pronounced in some countries (such as Zambia, Tanzania, and Senegal) that the relative contribution to GDP of agriculture had risen over time.³⁸

Few of the plausible explanations for retrogression of this nature were ‘exogenous.’ (Drought “might” be seen as an exception.³⁹) To capture these effects, the principal features of a regressing economy were modeled by reversing the direction of an endogenous growth model. Corruption, measured as an increase in the unlawful “diversion” of public resources, reduced the investible surplus. As corruption intensified, public confidence declined. There was an increase in capital flight (and other defensive actions by asset holders). This led to further reductions in investment. That, in turn, reduced the growth rate of income and lowered savings and investment even further. The model also incorporated a “backlash” feature that hinged on the reactions of groups most seriously affected by resource diversion. The same effect is produced in outside agents, e.g., donor organizations began forcing the governments they were supporting to observe principles of ‘good governance.’ This helped boost investor confidence, raising the rate of investment and helping spur income growth. Such a diversion/backlash mechanism generated a wide range of time paths for retrogression and recovery.

The above framework can be readily adapted for examining the dynamic impact of HIV/AIDS on economic growth. The rising prevalence of HIV/AIDS lowers worker efficiency, raises costs, and reduces individual savings and firms’ profits. Individuals who are HIV-positive increase their consumption, in part to combat the effects of the disease and, in part, because the prospect of a premature death raises the opportunity cost of time.⁴⁰ These changes lower the supply of investible resources, at both the individual and national levels, and reduce the efficiency with which the existing stock of productive

assets is used. Those effects, in turn, lower the rate of growth of per capita incomes, setting off a further cycle of declining savings and investment.

One could imagine that such a process might have a “floor” that provides the basis for economic recovery if measures were devised to prevent the overall efficiency of the labor force from declining. Several mechanisms might suffice. One would be to lower the rate of infection of workers through reductions in the costs of combating HIV/AIDS.⁴¹ Another would be to manage, train, and motivate workers who are HIV-positive in ways that maintain (and even improve) their productivity.⁴² A third would be to use external resources (foreign aid and technical assistance) to compensate for the decline in the local supply of investible resources and loss of domestic skills.

A major problem with these measures is that, to be effective, they all require additional resources. This places many African countries, where HIV/AIDS is widespread, in a bind. To prevent further retrogression due to HIV/AIDS, they need additional resources. The resources, however, are not available because saving and investment have fallen as a result of the HIV/AIDS epidemic.

b. HIV/AIDS and Retrogression

The above description broadly summarizes our conceptual framework linking the effects of the spread of HIV/AIDS to economic growth. When an individual becomes HIV-positive, his/her productivity declines, medical expenses and other costs rise, and economic behavior changes (if for no other reason than economic horizons shorten).

The principal building blocks of this framework include:

- The theory of endogenous growth
- Falling rates of savings and investment
- Rising opportunity costs of time for those who are HIV-positive
- Declining labor productivity
- Progressive loss of skills and the increasing erosion of the effectiveness of key (social and economic) organizations

Each of these points is discussed in turn.

Endogenous Growth: Theories of endogenous growth derive their inspiration from a number of sources.⁴³ The principal idea is that increasing returns to scale (resulting largely from the accumulation of knowledge) boosts the rates of savings and investment. The higher rate of investment leads to an acceleration of the rate of economic growth. There are several “knowledge-based” explanations that are used to support this theory. These include “learning-by-doing”,⁴⁴ “induced innovation”,⁴⁵ the effects of rising population,⁴⁶ and “learning-by-trading.”⁴⁷ In many African countries, particularly those that have had poor economic performance over extended periods, there is also the prospect of “learning-by-reforming,” most notably during the transition period.⁴⁸

Whether the resulting growth path involves a “permanent” acceleration of the rate of growth or cycles in the rate of growth (e.g., as in the so-called “new economy”) is still subject to debate. The essence of endogenous growth is that there are “spread” effects that raise efficiency more generally in the economy. Adam Smith captured this idea when he described the advantages of the ‘division of labor’ that was earlier stimulated by the ‘expansion of the market.’⁴⁹ The efficiencies resulting from specialization and the division of labor lowered costs thereby further expanding the market. In more recent times, Gunnar Myrdal described this as a process of “cumulative causation.”⁵⁰ The basic idea is that existing economic activities benefit from the fact that improving efficiency in other enterprises help to lower their costs. The overall effect is for all enterprises whose costs are falling to take action to expand their output. This sets off another round of spillover effects.

These insights help explain why endogenous growth is such a useful framework for understanding the micro- and macro-economic effects of HIV/AIDS. The reduction in savings and loss of efficiency associated with the spread of the disease is akin to “running Adam Smith in reverse.” As an increasing number of workers become debilitated and drop out of the labor force, many of the advantages of specialization and the division of labor are lost. Moreover, the loss of labor is a direct reduction of the nation’s productive capacity.

Falling Savings and Investment: The basic problem with attempts to tease out an independent influence for the impact of HIV/AIDS is that the economic performance of many African countries had deteriorated even before HIV/AIDS began to spread.⁵¹ For most African countries, the decline began with the oil and food “shocks” of the mid-1970s. Because of limited internal adjustment and frequent policy reversals, African countries were already heavily in debt and in precarious financial circumstances by the early 1980s. The HIV/AIDS epidemic compounded their problems. The difficulties were evident in adverse trends in key macroeconomic data. The following tables show that for most countries real income was declining, rates of investment and savings were falling, foreign aid flows rose rapidly, and there was a sharp increase in the debt burden. The data in the table covers the period 1970 to 1998 for SSA excluding South Africa and Nigeria.⁵²

The data show that average real per capita income was lower in the 1990s than in the 1970s. Savings rates have declined over time. Investment has fallen by less than savings but only because of a major increase in foreign aid and foreign borrowing. The size and duration of these external flows has been unprecedented. No region of the world has received such extensive support for so long. Yet, even these large and persistent resource flows have been unable to maintain investment at levels that will raise national income on a sustained basis.⁵³ The severity of the economic stress has compromised recovery efforts. The spread of HIV/AIDS has further aggravated the situation.

In this regard, it is useful to recall Harry Johnson’s characterization of economic development as a “generalized process of capital accumulation” where capital is broadly defined to include physical and human capital as well as institutions and organizations.⁵⁴

Sub-Saharan Africa: Selected Macroeconomic Indicators, 1970-1998

Year	GDP per capita (1995 USD)	Gross Dom. Invest. share of GDP (%)	Gross Dom. Savings share of GDP (%)	Net ODA all donors (bill. USD)	Net ODA all donors share of GDP (%)	Total External Debt ratio to GDP (%)
1970	612.0	17.3	21.1	1.1	1.6	..
1971	634.0	18.0	20.2	1.2	1.8	14.7
1972	623.3	16.8	22.2	1.3	1.7	15.0
1973	642.2	19.1	25.2	1.6	1.7	15.2
1974	681.8	21.0	28.1	2.4	1.9	14.5
1975	670.3	22.6	23.4	3.3	2.3	15.6
1976	669.5	23.6	25.5	3.1	1.9	16.2
1977	649.6	20.6	26.4	3.6	2.1	21.1
1978	641.0	20.4	24.1	4.9	2.6	24.8
1979	644.7	18.4	25.5	6.3	2.7	24.0
avg. 70s	646.8	19.8	24.2	2.9	2.0	17.9 *
1980	660.9	20.2	28.5	7.4	2.5	22.9
1981	671.7	22.8	23.2	7.3	2.5	26.4
1982	648.0	19.8	21.1	7.5	2.8	31.5
1983	617.3	16.2	20.5	7.3	2.9	37.1
1984	623.0	15.5	21.0	7.6	3.3	41.4
1985	601.6	13.8	21.2	8.5	4.1	54.2
1986	595.4	14.6	20.9	10.5	4.6	56.2
1987	591.8	14.6	20.5	12.1	4.8	58.6
1988	599.2	16.5	19.2	13.7	5.2	56.9
1989	599.0	15.8	19.4	14.5	5.4	58.3
avg. 80s	620.8	17.0	21.5	9.6	3.8	44.4
1990	587.2	14.2	17.9	17.3	5.8	59.7
1991	573.5	17.0	18.2	17.0	5.6	60.6
1992	550.2	14.7	13.0	18.3	5.8	60.0
1993	542.6	16.2	14.5	16.8	5.5	65.5
1994	541.5	17.5	16.5	18.2	6.3	78.1
1995	548.5	18.5	16.2	17.9	5.6	73.6
1996	558.8	17.7	17.7	15.7	4.7	69.5
1997	561.9	17.4	16.4	14.2	4.1	63.6
1998	558.2	17.8	14.8	54.5
avg. 90s	558.0	16.8	16.1	16.9 *	5.4 *	65.0

Notes: * - Average for the years with observations

Source: World Bank Africa 2000 CD-ROM Database

Sub-Saharan Africa excl. South Africa and Nigeria: Selected Macroeconomic Indicators, 1970-1998

Year	GDP per capita (1995 USD)	Gross Dom. Invest. share of GDP (%)	Gross Dom. Savings share of GDP (%)	Net ODA all donors (bill. USD)	Net ODA all donors share of GDP (%)	Total External Debt ratio to GDP (%)
1970	334.6	15.0	24.9	0.9	3.4	..
1971	344.7	15.7	22.3	1.1	3.6	25.3
1972	347.6	16.1	23.7	1.2	3.7	25.9
1973	349.5	16.9	25.2	1.5	3.8	26.6
1974	363.5	19.4	26.9	2.4	4.9	28.1
1975	362.6	20.2	23.0	3.2	5.6	29.8
1976	372.3	19.9	25.5	3.1	4.8	32.1
1977	370.0	19.5	24.5	3.6	5.0	38.4
1978	367.1	19.1	22.1	4.9	6.0	42.6
1979	366.2	17.6	20.5	6.3	6.6	42.7
avg. 70s	357.8	17.9	23.9	2.8	4.7	32.4 *
1980	357.4	18.1	20.4	7.4	6.5	45.4
1981	362.0	18.8	18.6	7.3	6.3	50.7
1982	359.8	17.7	19.4	7.5	6.7	57.4
1983	353.4	15.3	19.2	7.2	6.9	64.0
1984	348.7	14.2	20.7	7.5	6.8	67.2
1985	346.9	14.7	20.8	8.5	7.3	78.7
1986	349.4	15.2	20.6	10.4	7.7	75.8
1987	347.0	15.4	19.2	12.0	8.4	82.6
1988	349.2	16.7	16.5	13.6	9.1	80.5
1989	348.3	15.3	15.9	14.2	9.5	84.4
avg. 80s	352.2	16.1	19.1	9.6	7.5	68.7
1990	341.5	16.0	15.0	17.0	11.0	91.7
1991	336.4	20.1	16.6	16.7	10.8	96.7
1992	322.7	15.7	7.0	18.0	12.5	109.2
1993	316.3	17.3	10.1	16.3	11.4	120.8
1994	314.1	19.3	14.3	17.7	14.3	135.4
1995	322.6	19.3	12.6	17.3	12.5	126.0
1996	330.9	20.2	13.3	15.1	10.0	113.5
1997	335.5	19.6	14.4	13.5	8.6	105.4
1998	338.3	19.3	13.3
avg. 90s	328.7	18.5	13.0	16.5 *	11.4 *	112.4 *

Notes: * - Average for the years with observations

Source: World Bank Africa 2000 CD-ROM Database

Much of what African countries have experienced over the last two decades, as a result of economic decline and the spread of HIV/AIDS, can be seen as a generalized process where capital (as defined above) has been decumulating. Since income is the return on wealth and wealth is the capitalized value of income, the reduction in the stock of (all types of) capital has led to lower rates of income growth (with declines in numerous instances), lower savings and (despite large amounts of foreign aid) lower investment.

Another factor that has endogenously lowered savings and investment has been the general loss of confidence among (local and foreign) investors in Africa. The process whereby that has happened can be understood in terms of the theories of irreversibility and options values. Investment is defined as an action that involves a certain present outlay in the expectation of a future return. All investment is characterized by some sunk costs, or “irreversibility.” Those costs may be reflected in the purchase of specialized equipment, the time taken to conceive of and develop the investment project, or the opportunity cost of alternative investments passed over once the decision to pursue a particular course of action is taken. These costs, by definition, cannot be retrieved should the investment be liquidated. Investors expect, however, that future returns from the investment will amortize these sunk costs.

The prospect of irreversible costs adds to the uncertainty. It also raises the question of the value of alternative options. These “option values” exist because all investors have alternatives, the most obvious of which is to do nothing, i.e., decide to wait. But, like all investment, “waiting” has an opportunity cost as well. When there is growing uncertainty, as has been the case in African countries where growth has been so low, the costs of waiting are more likely to be small relative to the potential costs associated with irreversibility. For many potential investors in African countries, especially those with connections to international financial markets, the alternative activities may be lucrative, low risk and highly attractive.

Taken together, the notions of irreversibility and options values are crucial considerations when both locals and foreigners contemplate investing in African countries. Investors are more likely to wait when they have information indicating that the spread of HIV/AIDS will affect adversely the cost structure of any investment they are contemplating. Under these circumstances, waiting provides time to reassess and re-evaluate their options. Having a low-risk, secure (foreign) alternative investment reduces the urgency of committing their resources.⁵⁵ The outcome has been devastating in terms of stimulating new activity across Africa. As the perceived costs of dealing with the spread of HIV/AIDS rises, the rate of investment tends to decline. This has reinforced the decline in the supply of investible resources, already under pressure through falling productivity due to the spread of HIV/AIDS.

Rising Opportunity Cost of Time: One microeconomic mechanism that has reinforced the decline in savings has been the diminished incentive for those who are HIV-positive to save. Although many people who are HIV-positive also have lower incomes from which to save, especially as they become increasingly debilitated, the two effects need to be analyzed separately. The prospect of a premature death raises the opportunity cost of

time. There is now a wealth of research, dating back to Irving Fisher, tracing the systematic changes that occur in the ratio of consumption to saving as patterns of time preference change.⁵⁶ For risk averse individuals, the standard result is that time preference is inversely proportional to the length of the decision horizon. The relevant decision horizon for people with HIV/AIDS shortens dramatically. As noted in Annex B, it is normally five to seven years from the diagnosis of HIV to the onset of AIDS. Death comes within one or two years after that.

A similar response can be derived from the ‘life-cycle’ model of savings.⁵⁷ The underlying theory recognizes that there is a systematic shift in the relationship between a worker’s earning potential and the pattern of family formation over his/her life cycle. Early in a person’s working life, income streams and resource demands are rising. With the expectation of a “normal” life span of work, the person has the capacity to finance his/her consumption and asset accumulation goals based on the expectation of higher income flows later in his/her productive life. The spread of HIV/AIDS, however, has sharply reduced what individuals can “normally expect” from their (truncated) life span of earnings. Once an individual is HIV-positive, his/her consumption rises while at the same time his/her potential future earnings stream is cut. Thus, when viewed in terms of the ‘life-cycle’ model, we would expect to see a major reduction in individual savings. To the extent that the individual has accumulated wealth during his/her working life, there will be dissaving.⁵⁸

Much the same result can be derived from the notion of ‘overlapping generations.’ The typical approach is to assume two generations – one generation produces, the other consumes. (The effect is the same as a continuous two-part ‘life-cycle’.) In this formulation, accumulation and growth occurs because the output (or income) produced by the generation of producers exceeds the output absorbed (or expenditure) of the generation of consumers. With the spread of HIV/AIDS, this balance between production and consumption shifts in ways that reduce this inter-generational surplus, thereby reducing accumulation. This effect is reinforced as the dependency ratio (the ratio of workers to persons under 15 years of age) shifts. A major feature of the HIV/AIDS epidemic has been the sharp rise in the number of orphans.⁵⁹ The implication is that the extent to which the generations overlap has undergone a serious, systematic, and adverse change. The net outcome is to reduce the capacity of economies with a high prevalence of HIV/AIDS to save and invest, and ultimately to accumulate and grow.

Declining Labor Productivity: Factors that reduce the rate of investment lower labor productivity by reducing the level and/or rate of growth of physical capital with which labor is combined to generate output and income. From the usual conditions attached to production functions (positive productivity of all factors, diminishing marginal productivity of individual factors), a decline in capital per worker reduces output per worker (all other things being equal). Further reductions in productivity occur when workers are demoralized and distracted.

Apart from those who are in complete denial, individuals with HIV recognize that they face a premature death and a shortened decision horizon. Under normal circumstances,

individuals facing rising opportunity costs of time would invest in labor saving capital and technology. This option is often unachievable for those who are HIV-positive due to higher costs they incur for (formal or traditional) medical services. Thus, while the spread of HIV/AIDS induces the need for higher rates of investment to help maintain worker productivity, it erodes the means by which such investment can be financed.

If finance could be arranged (for example, through the efficient use of foreign assistance), the strategic use of new technology would allow countries to compensate for the loss of labor due to HIV/AIDS. The obvious drawback to such a strategy is that it takes resources to acquire new technologies and skilled personnel to operate them. Though a drawback, this should not be an insurmountable problem, particularly if attention is given to devising goal-oriented practical training.⁶⁰

A further element reducing labor productivity is the reduction in real effective demand associated with the decline in real per capita income. As already noted, real incomes across Africa were declining well before the onset of the HIV/AIDS epidemic.⁶¹ Adding HIV/AIDS to the equation has reinforced the decline. This has occurred through a mechanism described by Adam Smith over two centuries ago. But, while Smith described the benefits (to output, productivity, and growth) of expanding the “extent of the market,” the circumstances in Africa have been equivalent to running the mechanism he described in reverse. The decline in real effective demand raises the unit costs of all domestic activities. For African countries where infrastructure is poorly developed, one obvious change is an increase in transport and distribution costs as a proportion of total costs. The relevance of this point becomes increasingly evident when one distinguishes, as T.W. Schultz did, between the economic and the physical supplies of land.⁶² The latter is the land base of a country or region. The former is the land area that, for given technology and market conditions, yields a positive net rent. Declining real effective demand reduces the net rent from all economic activities and by extension reduces the productivity of all factors including the labor that contributes to these activities. The outcome is contraction in the economic supply of land. Furthermore, since land is an important component of wealth in African countries, the declining economic supply of land reduces the value of wealth. This leads to a further contraction in real effective demand, further lowering the productivity of associated factors of production.

Other factors contribute to the decline in labor productivity. The theory of efficiency wages is based on the recognition that, because of fixed costs of employment (hiring, training, settling-in), firms will have an incentive to pay above-market wages in order to keep their employees. A further aspect of the theory is that firms will pay workers above-market wages because of the direct link between wages and worker productivity.⁶³ Annex A reviews what employers have been doing in Southern Africa through training and reorganization of work schedules to maintain productivity. Annex B explains the incentives employers have to providing training.⁶⁴

In these matters, one can readily imagine that both these processes work in reverse as the HIV/AIDS epidemic intensifies. Because of increasing debility and absenteeism, the marginal value product of workers who are HIV-positive is less than the wage being paid

by the employer. Faced with this situation, firms have an incentive to reduce employment and/or take steps to reduce labor costs. Doing this, however, reduces the incomes of all their employees whether they are HIV-positive or not.⁶⁵ To the extent that the efficiency theory of wages holds, overall efficiency declines.

The severity of the economic decline in Africa, however, has resulted in some practices that tend to contradict the efficiency theory of wages. There is mounting evidence that working hours have tended to increase across Africa as a means of counteracting the decline in reward per hour. The problem has been compounded by the inability of most African countries to generate increases in net employment in their formal sectors. In Zambia, for example, there has been no increase in formal sector employment for more than two decades.⁶⁶

This “informalization” of employment has increased average hours worked in a number of ways. Employers in the informal sector, by definition, are not subject to government regulation. Individual workers have the option of remaining unemployed or accepting the conditions offered. A second factor has been the proliferation of “coping strategies.” Such strategies are low productivity, time-intensive activities that are characterized by extreme risk aversion. They generate limited amounts of income but because the risks of disruption created by government interference have been minimized, the variability of income is low.

The trends are antithetical to efforts to raise growth since they work in ways that tend to lower productivity. The growth accounting literature, for example, has shown that a major source of productivity growth in developed countries has been the *reduction* in hours worked.⁶⁷ Several factors contributed. Shorter working hours reduce worker fatigue, improve motivation, and require employers to pay closer attention to organization and management. Since much of the change in hours of work has come from dropping the half-day on Saturday, there was also an increase in the ratio of productive work time to travel time.

A negative link can emerge between the process of economic retrogression and declining labor productivity. As economies regress, the lower level of output systematically lowers the average product of labor. Unless real wages fall at a rate faster than the decline in productivity, or the exchange rate depreciates correspondingly, unit labor costs will rise. Without these adjustments, the rising prevalence of HIV/AIDS will further undermine international competitiveness across Africa. Since African countries have already undergone considerable “marginalization” due to the inability to compete in international markets⁶⁸ and to grow,⁶⁹ a continued loss of competitiveness will undermine their capacity for sustained growth and development.

There is an ironic twist in these changes. The typical argument has been that globalization and premature liberalization lead to the loss of competitiveness as goods produced by “cheap” labor out-compete local products. The logic of the argument above is that, in countries where HIV/AIDS is spreading rapidly, real unit costs of labor will need to decline (i.e., labor will need to become correspondingly “cheaper”) if these

countries are not to suffer adversely from competitive labor in countries (both developed and developing) where HIV/AIDS has a less severe impact on productivity.

We conclude this section by noting the special problems facing agriculture. There is now widespread evidence pointed to exceedingly high rates of HIV infection in many farming and fishing villages.⁷⁰ The death of large numbers of working age adults in rural areas has led to a dramatic increase in the number of child-headed households and orphans living with their grandparents.⁷¹ For years, agricultural specialists have argued that in order to boost agriculture across Africa there has to be an expansion of technology and knowledge-based production. Governments and donor agencies have devoted large amounts of effort “extending” such technology and knowledge through a variety of (often costly) programs. The emerging dilemma is how the farming households headed by children and grandparents can raise the resources and absorb the knowledge (and hence take the steps) needed to raise agricultural productivity.

Agricultural scientists and professional extension workers were encountering major difficulties formulating and conveying information about appropriate “packages” to African farmers well before problems associated with the spread of HIV/AIDS emerged. Their task is orders of magnitude more difficult now, particularly since the loss of adult workers has lowered the average educational levels in rural areas. Without potential solutions, the productivity of agriculture will decline and the one sector in Africa that has the prospect of stimulating growth and reducing poverty, namely agriculture, will continue to falter.

Progressive Loss of Skills and Erosion of Institutional Capacity: A major consequence of HIV/AIDS in organizations such as government departments and agencies is the loss of “institutional memory.” As more senior members of the staff become debilitated and die, there are fewer people with the experience to help younger staff members place their work in perspective. There is also a decline in the amount and scope of on-the-job guidance (“mentoring”) that is common to all large organizations. The loss of senior staff affects the consistency and direction of organizations as well. For example, budget offices and central banks depend for their effectiveness on a set of well-established procedures being followed. The loss of key staff from these (and other) organizations has undermined the ability of African governments to provide the services crucial to operating a modern economy.

Countries where HIV/AIDS has spread rapidly have major difficulties maintaining the integrity of these organizations and their procedures. In Zambia, for example, the rate of staff attrition has been so high in these key organizations that they have been progressively unable to fulfill their roles in effectively managing the economy.⁷² Loss of staff is only one of several issues. Because the Public Service Commission has been slow to confirm staff in their positions, the number of “acting” appointments has proliferated. This reinforces the sense of impermanence in the civil service further reducing morale and performance. An added outcome has been an increase in irresponsible behavior and opportunism that (due to lack of monitoring and declining morale) remains largely undetected and un-remedied.

In the *limits of organization*, Nobel laureate Kenneth Arrow explained why modern economies and societies have large organizations. Arrow noted that when viewed in purely economic terms "...organizations are a means of achieving the benefits of collective action in situations in which the price system fails."⁷³ Their purpose, Arrow asserted, is "...to exploit the fact that (virtually all) decisions require the participation of many individuals for their effectiveness."⁷⁴ The pervasive character, persistence, and cost of uncertainty imply a special need for cooperative decisions and, consequently, for organizations. Arrow discussed how improvements in organizational design that enhance the flow of information improve the effectiveness of collective actions. He also noted the importance of education (referring specifically to Pareto's notion of the "circulation of elites", i.e., the highly skilled) as providing the basis for redefining the agendas of organizations and raising their performance and thereby adding to social welfare.⁷⁵

As we have done earlier, one can readily imagine this process running in reverse. As HIV/AIDS takes an increasing toll on skilled workers (particularly those who provide the administrative and strategic capacities), the performance of critical organizations will decline. In extreme cases, the organizations may even become dysfunctional, especially in cases where HIV/AIDS compounds the operational difficulties of organizations that were already under serious economic stress. Obvious examples are the many state-owned enterprises across Africa whose effectiveness has diminished as they scale back to curtail their deficits and pay off their accumulated debt.

Overview: The above points have highlighted some of the considerations that underpin the approach taken here to the impact of HIV/AIDS on economic growth. All of the mechanisms described draw on well-established theoretical constructs. We have taken advantage of the fact that economic regress, like economic growth, is a systematic process. Most of the familiar relationships that we habitually see as fostering "progress," can also be reversed.

The problem with regression, however, is that once underway, there has (so far) been no easy stopping point. Some African countries --- Ghana, Zambia, Tanzania, Senegal, Cameroon, and Chad come readily to mind --- have experienced long periods of economic decline and dissipation. Re-creating the conditions for growth and development has been far more difficult than simply reversing the direction. Attitudes shift, behavior changes, and the demands for additional "safety-margins" and "security" intensify before individuals will re-embrace the economic reforms. When the damage wrought by the spread of HIV/AIDS is added, the difficulties are compounded.

3. Testing the Model

a. Some Preliminary Results

It is beyond the scope of this paper to formally develop and broadly test a cross-country model of HIV/AIDS-induced retrogression described above. In Annex C, however, we

have estimated a small (four equation) econometric model using Zambian data to determine if two variables most directly related to the spread of HIV/AIDS, changes in life expectancy at birth and changes in the dependency ratio, have had an independent effect on economic growth.

The model covers the period 1968 to 1998. It was estimated using three-stage least squares (3SLS).⁷⁶ The four equations explain the growth of real income, the growth of real investment, the change in the nominal exchange rate, and the change in the domestic price level. The last two variables have been included to capture the effects of the underlying economic disruption to which the problems created by the spread of HIV/AIDS have added.

Zambia's present economic problems began in the mid-1970's, when in response to a major output and price shock in the copper sector, the government attempted to finance the resulting economic imbalances rather than adjust. The combination of large amounts of foreign assistance (well over 20 percent of GDP for extended periods), a series of failed adjustment programs (eleven so far), large budget deficits, rapid monetary growth, and manipulated exchange rates, have led to a sustained decline in real per capita income in Zambia. Under Kaunda's second republic (1972-1991), that decline was close to 50 percent. So far, under Chiluba's third republic (1992 to the present), the decline has been around 30 percent.

The HIV/AIDS epidemic has been superimposed upon this broad-based and (essentially) unrelieved pattern of economic regress. With HIV infection rates for the adult population of well over 20 percent, Zambia's experiences, unfortunately, offer an opportunity to gauge the value of the endogenous growth model as a framework for linking the effects of HIV/AIDS to economic growth.

The growth equation contains the change in real investment, the change in the real exchange rate, the change in life expectancy at birth, and the change in foreign aid. The investment equation includes the growth of real income, the growth of the labor force, and the change in the real exchange rate. The intention is to determine the direction and strength of the relationships among growth, investment, life expectancy, and age dependency within the context of a simultaneous system. A full explanation of these variables and the results are reported in Annex C.

The change in the life expectancy ratio is included in the growth equation to measure, to the extent possible, the independent effect of HIV/AIDS. Since investment is a major determinant of growth and age dependency has an important effect on savings behavior, we expect the link from age dependency to growth to be indirect. Sharp changes in life expectancy and age dependency have been evident in Zambia from the early 1990s, the period when HIV/AIDS became a full-blown epidemic. The labor force growth rate (which began to decline during the 1990s) is included in the investment equation to capture the effect on investment demand of the growth of the labor force. A key element of all theories of economic growth (dating from the Harrod-Domar model) is that

employers attempt to maintain the stock of capital per worker. Such behavior would keep investment (adjusted for depreciation) growing at least at the rate of the labor force.

Preliminary results from this small empirical model show that change in the life expectancy at birth and the age dependency ratio have statistically important effects on the rate of economic growth with the expected respective signs. The coefficient of the change in life expectancy in the growth equation is 0.68 and is highly statistically significant. The coefficient on age dependency in the investment equation is -1.159 and is also highly significant.

Although they are explained in more detail in Annex C, these results show that the dramatic drop in life expectancy recorded in Zambia during the 1990s has reduced the rate of economic growth. Furthermore, the increase in age dependency has reduced investment. Because of the direct links from investment to growth, this too has reduced the rate of economic growth.

b. Developing a Full Scale Model

While the results we have obtained are suggestive, there are important issues not addressed here. What economic responses can be expected as the HIV/AIDS epidemic intensifies? What is the feedback from declining growth rates to the spread of HIV/AIDS? Is there evidence that the spread of HIV/AIDS is creating barriers to economic recovery? Testing these ideas will require the specification and estimation of a broader, more comprehensive, comparative model. The remainder of this section discusses issues involved in doing that.

From the outset, the endogenous growth framework we have proposed already provides useful insights regarding the dynamics of HIV/AIDS. There is a problem with using the model to make projections. Earlier, we noted that the conventional estimates of growth scenarios based on estimates derived ‘with AIDS’ and ‘without AIDS’ misrepresent the underlying dynamic relationship between HIV/AIDS and economic growth. African countries have been experiencing the progressive (and cumulative) effects of the epidemic for most of the last two decades. Thus, there is no model of an African economy that can be constructed *without* the impact of HIV/AIDS having already influenced its basic structure. In practical terms, this implies that any projections made using a model will need to be updated on a regular basis as more information emerges on the changing structure of the underlying economy due to the spread of HIV/AIDS.

Another factor hindering the construction of any model is the general lack of data on the course of the epidemic. As noted in Annex A, the data that are available are not highly reliable or complete due to the widespread pattern of denial and official obfuscation. Faced with these circumstances, modelers invariably turn to proxies as we have done above. Proxies are variables that are highly correlated with the variables that cannot be fully observed.

Obvious proxies are those used above (life expectancy and age dependency). Many more could be used. Some of these include the growth rate of population, trends in the production of staple foods (which in Africa are typically highly labor-intensive), the gap between actual and expected death rates, changes in the flow of foreign aid devoted specifically to health, the number of extraordinary deaths among health workers and teachers, and the increase in “acting” staff in the civil service. These variables would be included in a broader econometric model for a particular country, or set of countries, and examined for both the sign and significance of their coefficients. As demonstrated by the example provided in Annex C, there are now a host of small-scale models that include some of the key macroeconomic variables containing the main elements of a model of retrogression.⁷⁷

It is always difficult and somewhat presumptuous to predict the sign and significance of variables in simultaneous equation models. That difficulty is accentuated in an African context where many countries for many years have had large internal and external imbalances. Because many of these economies are in transition as they reform, empirical estimates often show estimated relationships that run the wrong way. For example, it is common to find that imports and the nominal exchange rate are positively related. In this case, the problem is that most countries receive additional foreign assistance on condition that they devalue their currency. Thus, a depreciation of the exchange rate is often associated with a surge in imports. Both variables, however, are highly correlated with a “third variable”, namely, foreign aid.

The role of simultaneous estimation is to help sort out the various direct and indirect associations among the key variables. Nonetheless, because most African countries have been operating well inside their production possibility frontiers for so long, many of the normal “trade-offs” that apply when the economy is in general equilibrium do not hold. They only begin to take effect once most of the slack has been eliminated from the economy.

Where does this analysis leave us? The theoretical discussion and empirical results in Annex C suggest that the model of retrogression (based on endogenous spillover effects) is a useful direction to pursue. Furthermore, as expected, the initial results suggest that there is a curvilinear relationship between the course of the HIV/AIDS epidemic and economic growth. Initial evidence from the model is that the elasticity of income with respect to changes in life expectancy is less than unity. Does this imply that some important thresholds (with respect to the supply of skills or the performance of key organizations) have already been crossed? Such details will have to await studies of individual countries.

In Zambia’s case, however, we do know that the country has been undergoing sustained economic decline since the mid-1970s. Despite almost a dozen formal adjustment programs, successive Zambian governments have been unable to reform the economy in ways that produce sustained economic growth and development. What is clear from those who have studied the economy closely is that the accelerating loss of skilled personnel and the increasing pattern of institutional dysfunction among key organizations

(central bank, ministry of finance, ministry of agriculture) suggest that economic recovery will not be automatic or rapid.⁷⁸

What are the next steps? What does the above approach suggest about the implications of HIV/AIDS on economic growth? Under present circumstances, African countries will remain in a downward spiral so long as behavior patterns do not change. These changes need to occur on three levels. First, the personal and collective behaviors that lead to the spread of HIV have to be modified. Second, governments have to ensure they devote their full attention to promoting and sustaining economic reform. And third, foreign agencies interested in helping African countries move beyond the ravages of HIV/AIDS have to radically restructure their assistance so that it does not overload the agendas of governments that are already severely over-stretched.

Are the prospects high that these three requirements will be met? High-risk activities in many parts of the continent are being modified. This may be happening too slowly for some specialists. Nonetheless, knowledge about HIV/AIDS is widespread and national leaders are beginning to speak out, after years of irresponsible and, for many of their citizens, fatal silence. The challenge is to sustain the progress that is being made. Of course, for some collapsed and collapsing states (the former Zaire, Congo-Brazzaville, Sierra Leone, Zimbabwe, Angola, Somalia, Liberia, Rwanda) much more will have to be done before progress of even the most rudimentary form emerges.

On the second point, African governments have development agendas that keep them over-committed.⁷⁹ The result is that much of the efforts towards economic reform across Africa have essentially been preprogrammed to fail. This matter can only be resolved if African governments, and those whose representatives assemble periodically in Brussels, Paris, London and Washington to determine Africa's development agenda, reduce what is being attempted so that whatever is achieved can be sustained. In this regard, the experience of Asian countries over the last three decades has a clear lesson for Africa.⁸⁰ Focus on a few priorities that matter most. Make progress on them, and build upon that.⁸¹

Regarding the third point, the majority of donor agencies continue to pursue a muddle of jumbled initiatives and distorted priorities. Being the largest and most prominent, the World Bank and the International Monetary Fund, are perhaps the easiest to categorize. After fifty plus years of operation, World Bank management is still groping to discover the types of actions and activities essential to economic development.⁸² The World Bank supports some excellent research. Nonetheless, there has been a major disconnect between the lessons of that research and the conclusions drawn by the Bank's management. This has greatly diminished the contribution to development that the Bank could have made if its resources (financial and intellectual) had been selectively and judiciously applied.

For much of the last three decades, the IMF has attempted to soften its 'sharp-pencil' image. Its latest venture in this direction is to encourage developing countries to formulate and implement "poverty reduction and growth strategies." There are serious

doubts about whether the IMF can (or even should) attempt to deal with poverty in a systemic way. At the very least, the emphasis in the strategy is back to front. Without an emphasis on growth, poverty reduction has proven to be impossible. Furthermore, as recent debates surrounding the Meltzer report to the U.S. Congress have shown, we are not alone in arguing that any focus by the IMF on “poverty reduction” misconstrues the role of the Fund and pushes it into areas where it has a major comparative disadvantage.⁸³

The implication is clear: to borrow Wellington’s phrase, much “hard pounding” is needed. To be effective, African citizens, policy makers, and the donors that wish to help will have to confine their attention (and keep it confined) to the issues instrumental to growth. Since that has not happened across Africa in the last three decades, what are the indications that it will begin to happen?

Unless one begins to look beyond the depth and breadth of the tragedy that has been unfolding with the spread of the HIV/AIDS epidemic, it would be difficult to believe that circumstances can change dramatically. Yet, as President Clinton noted in his inaugural speech “there is nothing wrong with America than cannot be cured by what is right in America.”⁸⁴ Africa and Africans are resilient. Some, like the editors of *The Economist*, may have given up and branded the continent as “hopeless.”⁸⁵ For others, the challenge is to continue striving. HIV/AIDS has exacted and will continue to exact a terrible toll. After a belated response there are indications that major efforts are being made to change behavior and contain the disease. These efforts will slowly take effect and provide Africans with the hope that they can begin to think about tackling the development challenges they face as they move beyond HIV/AIDS.

4. Concluding Comments

This paper describes a conceptual framework for assessing the effects of HIV/AIDS on economic growth. The framework we use has a number of novel features. It dispenses with the conventional approach of comparing scenarios that purportedly pertain to situations ‘with AIDS’ and ‘without AIDS’. We argue that such approaches are fundamentally flawed. In particular, they grossly misrepresent the dynamics of the HIV/AIDS epidemic.

The approach we follow takes its inspiration from endogenous growth theory. That theory explicitly recognizes the spillover effects that result from increasing returns to the generation, dissemination, and use of knowledge. The spillovers raise the rate of savings and investment, and ultimately the rate of growth. The spread of HIV/AIDS has negative spill-over effects that undermines a country’s capacity to save and invest. To measure the impact of the epidemic, we imagine an endogenous growth model “running backwards.” Using this mechanism, we can explain why and how economic growth will decline as HIV/AIDS intensifies.

We further enhance the dynamics of the model by taking advantage of several other theoretical concepts --- the opportunity cost of time, irreversibility and option values,

efficiency wages, over-lapping generations (or 'life-cycle') theories of saving, and coping strategies. These ideas help explain the various incentives that individuals and employers confront as they deal with issues related to HIV/AIDS. We conclude that when the prevalence of HIV/AIDS is high and rising, as has been the case in most African countries, the incentives are skewed towards greater consumption and reduced investment. The consequence is a decline in the rate of growth.

Most African countries have been under extreme economic stress as a result of the shocks of the mid- and late-1970s and weak (mainly failed) attempts to adjust to these shocks. The HIV/AIDS epidemic has added to the stress. By stripping countries of some of their best talent and undermining the incentive to invest, these difficulties may be condemning African countries to extended periods of stagnation and decline.

The challenge for policy makers and agencies that seek to help promote growth and development across Africa is to understand how the epidemic is affecting the behavior and activities of everyone in society. Special attention needs to be given to the challenge of maintaining (and even increasing) productivity of those who are HIV-positive. Doing this will require a shift in attitudes and the re-orientation of current programs. A further dimension will be to help stabilize the key organizations responsible for managing the economy and maintaining the integrity of basic social processes. This is an area where the donor community can make an effective contribution. Though it appears to be "turning back the clock", donor agencies have a special role in providing technical assistance to strengthen the performance of these organizations. In the absence of such support, it is difficult to see how African countries, on their own, can break out of the pattern of regression that the spread of HIV/AIDS has been reinforcing.

Annex A

Work Place Interventions in Response to HIV/AIDS

by

Deborah A. Hoover

1. Introduction

The following literature review highlights the experience that is emerging on work place interventions in response to HIV/AIDS in Sub-Saharan Africa. My specific emphasis is conditions in Southern Africa. Over recent years, the material available on work place interventions has expanded although the data remain limited in scope and reliability.

This paper also proposes a set of criteria for developing work place interventions. The objective is to provide readers with a detailed analysis of the existing data, and guidance regarding their value in mitigating the effects of the epidemic. With more than one-quarter of the working age adults infected with HIV/AIDS in several Southern African countries, the private sector can no longer afford to neglect the medical reality. Excuses that action is limited because companies lack resources, or have inadequate knowledge of the issues, or that the topic is too sensitive, are no longer acceptable.

The criteria developed in this study draw heavily upon the author's experience with capacity building programs in several African countries and a thorough review of work place interventions in response to HIV/AIDS in Sub-Saharan Africa. The criteria take for granted that management decisions concerning the work place should respect and enforce basic human rights.

A major barrier to comparative analyses of the impact of HIV/AIDS in Southern Africa is the inaccuracy, lack of detail, and nonexistence of employee medical statistics.⁸⁶ Even when personnel office or human resource records are accurate regarding length of employment, they often do not include reasons for worker separation or termination of their employment. The continuing widespread denial and stigma associated with HIV/AIDS has compounded this problem. Employer's records of the cause of debility or death typically treat AIDS as an opportunistic infection. As a result, information related to the effects of AIDS interventions in the work place cannot be analyzed by sector, profession (or occupation), employment grade, length of service, or gender.

With relevant statistical data so scarce, researchers have turned to interviews as the primary methodology for determining work place practices and responses. The interviewees usually have been managing directors, human resource managers, or personnel officers. Medical officers and peer-group educators are poorly represented even when those in the latter group manage the AIDS education program. In almost every instance in the literature surveyed, the interviewer has been working under the

auspices of an HIV/AIDS prevention organization such as UNAIDS (Joint United Nations Program on HIV/AIDS) or AIDSCAP (Family Health International's AIDS Control and Prevention Project). The limitations of this methodology could easily result in the information derived being dismissed as unsubstantiated, undocumented, inaccurate, and opinionated. Yet, aside from anecdotal information, these are the principal data available. Similar difficulties emerge in efforts to determine the costs of work place interventions since many of these are part of joint activities arising from employee education, training, or medical care.

In some cases, work place interviews have been supplemented with focus groups or worker discussion groups. The literature, however, does not indicate whether HIV positive employees, peer educators or medical personnel were included in these groups. There is some evidence showing that interviews with employee groups and labor unions contradict data from management, especially with regard to issues such as HIV screening, confidentiality of records, and discrimination practices.⁸⁷ Similarly, in-house medical personnel often have different views about the prevalence of HIV among the firm's workers than the views held by management.⁸⁸

Perhaps the major limitation in studies of work place interventions is that because HIV/AIDS has only reached epidemic proportions over recent years, companies have not been dealing with the disease for extended periods. The relatively short period involved has also limited efforts to measure the comparative effectiveness of different work place interventions. Consequently, the impact of many of the activities discussed here has yet to be evaluated for effectiveness. An added consideration is that because of the generally *ad hoc* responses that have emerged as HIV/AIDS has spread, many of the work place interventions were not specifically designed to respond to the challenges posed by the disease. In numerous cases, concerns about HIV/AIDS have been grafted onto ongoing education and/or training programs. In other cases, those concerns were added to schemes designed to restructure (often to "down-size") organizations.

2. Literature Review of Work Place Interventions

Until very recently, most work places across Sub-Saharan Africa had done nothing to directly address the HIV/AIDS epidemic. The predominant response often has been perfunctory and *ad hoc* efforts to create awareness. Most organizations have done little more than encourage the distribution of posters with warnings of the nature of HIV/AIDS and urging their workers to exercise caution in personal behavior.

The principal reason for this limited response is denial. Much has been written and said on this subject.⁸⁹ In the present circumstances, some repetition seems worthwhile because denial exists on so many levels.⁹⁰ Despite the variety of HIV/AIDS activities noted below, and despite the fact that companies now have work place interventions more than ever before, only a minority of companies have taken the initiative with respect to HIV/AIDS. Most companies, whether or not they have programs to address HIV/AIDS, continue to publicly deny or disregard the disease.

Three examples illustrate this point among the business community in Sub-Saharan Africa. In a 1995 profile of the Botswana Diamond Valuing Company (BDVC), management reported “no visible impact of HIV/AIDS on the company.” Yet, actions taken by the company suggest otherwise. In 1993, BDVC established one of the most extensive prevention programs of any business in Botswana, including the hiring of an AIDS coordinator and the development of an in-house drama program. It also sponsored condom vending and peer educators.⁹¹ The second example is taken from Uganda where a study of the productive labor force concluded that HIV/AIDS issues were not being incorporated into personnel policies in the work place.⁹² The third example concerns the National Business Initiative (NBI), an organization whose membership includes 170 leading South African and international companies that operate in South Africa. The NBI’s principal objective is to enhance the business contribution to South Africa’s success by assisting member companies in addressing some of South Africa’s most pressing socioeconomic problems.⁹³ There is no mention whatsoever of HIV/AIDS in the two most recent annual reports.⁹⁴ The inference is that HIV/AIDS was not seen as a “pressing socioeconomic problem.” As the information presented at the July 2000 Durban conference on HIV/AIDS demonstrated, the weight of evidence and expert opinions suggest otherwise.

Although HIV/AIDS may not have severely affected certain industries in the past due to its five-to-seven year incubation period, the disease is now a major epidemic, especially in Southern Africa. Indeed, Myron Essex of the Harvard AIDS Institute has recently referred to the “new” AIDS epidemic in Southern Africa associated with the spread of the highly virulent HIV-1C sub-type.⁹⁵ Despite the widespread evidence of the disease,⁹⁶ there are cultural and economic reasons why many companies and organizations continue understating or denying the reality of HIV/AIDS. Evidence of this is the general absence of forward-looking intervention strategies.

The majority of the work place interventions described below are characterized by avoidance. Businesses have avoided facing the systemic issues related to the spread of HIV/AIDS by finding ways to rid the employee pool of HIV-positive employees. The majority of company interventions typically focus on a combination of preventing new infections and avoiding and/or reducing the costs associated with existing and probable infections.⁹⁷ A smaller number of firms have adopted interventions that raise their costs through adjustments to employment, training and benefit schemes. Finally, even fewer businesses have adopted what I refer to below as ‘socially responsive’ interventions.

Business responses to the HIV/AIDS epidemic has been initiated by company management, often in consultation with one or more non-governmental organization. Examples where employees have initiated AIDS activities remain rare and largely undocumented. This is further evidence of the stigma attached to HIV/AIDS.⁹⁸

The work place interventions described below are organized according to four categories: prevention of new infections; cost avoidance and/or cost reduction; adjustments to employment, training and benefit schemes; and other, socially responsive interventions.

a. Prevention of new infections

If companies have responded to HIV/AIDS, the activities most often begin (and end) with an HIV prevention program. The size, longevity, and funding of these programs vary widely. The reasons given for starting such programs differ. In some instances, management has perceived that the prevalence of HIV/AIDS will have a significant effect on profits. Other companies suggest a more altruistic motive. They “want to show a concern for their workers” or “promote national awareness of the epidemic.” Other companies indicate financial cost/benefit reasons for developing prevention programs, noting that such programs “are relatively inexpensive and well worth the cost.” At the same time, a study of the commercial sector in Zimbabwe showed that there is little, if any, belief in the efficacy of AIDS prevention campaigns, and little interest in prevention activities.⁹⁹ Due to the lack of hard data, there is no convincing evidence that prevention activities are either effective in reducing HIV or cost-effective for the company.

Companies with the most promising activities for the prevention of new infections invariably have a history of external support, whether from the government or a donor agency such as AIDSTECH or AIDSCAP. When outside funding is discontinued, the program often ends.¹⁰⁰ Well-intentioned programs frequently suffer from repetition and lack of new information and materials, and gradually decrease to a token effort. One company complained that its employees “got bored” with the HIV prevention activities.¹⁰¹ In other cases, peer educators, working with few incentives and usually without re-education programs “burn-out” and lose interest.¹⁰² Other companies that had prevention programs curtailed them due to economic difficulties and downsizing.¹⁰³ When costs needed to be cut, HIV prevention programs were frequently treated as dispensable.¹⁰⁴

The primary means of establishing AIDS prevention programs in the work place is through education and awareness programs (including information and discussion groups, and media presentations), HIV/AIDS counseling, testing and treatment, the distribution of condoms, control of work place organization to decrease the risk of HIV, and in-kind donations.

AIDS Education and Awareness Programs The goal of these programs is to promote awareness about HIV and sexually transmitted diseases (STDs) for all employees, or more usually, a selected subset of employees. In most cases, education/awareness programs are operated at low cost to the company by a peer educator or by a designated AIDS coordinator. The latter may be the human resource officer or the company nurse, upon whom additional responsibilities are placed often without additional resources to cover salary, space, programming, or materials. Program funding (if any) usually comes from outside sources. Consequently, education and awareness programs vary considerably in scope and quality, and may consist of hosting a one-time education program operated and funded by an outside agency. Attendance is voluntary and the programs are inevitably directed at employees below the management level.

Peer education programs These are one of the more common educational awareness programs because they tend to be created by external agencies, such as an NGO that is sub-contracted by the company. Such programs can be operated at low cost or even no cost to the company. Peer educators are company employees, often on a voluntary basis, and are usually from the middle or lower level staff. They are rarely from management.¹⁰⁵ Peer educators are frequently responsible for the company's entire efforts in relation to HIV/AIDS including condom distribution, information and discussion groups, and the development of media programs.

A major drawback of work place education programs in response to HIV/AIDS is the narrowness of the information provided. HIV/AIDS education alone is insufficient to help people adopt preventive measures. A broader context is needed, including facts about methods of HIV transmission, safe sex alternatives, problems associated with drug use, prostitution, promiscuity, and matters related to gender inequality and violence against women. The last two, of course, raise broader social issues that are often intractable because they threaten existing social arrangements and (male) preferences.¹⁰⁶

Work place education and awareness programs take one of two forms -- lectures and discussion groups, and media communication. Each is described briefly below. Another way to classify these programs is according to their target audience. These include: new employees, all employees, management, and medical and human resource personnel. Each group will be discussed in more detail below. It is most common to find only one of these audiences targeted, or only one of these audiences at any one time.

It should be noted that, although companies frequently cite their education programs as their primary effort in HIV/AIDS prevention, their rhetoric often overstates the reality. The programs tend to be limited in scope; they often take place only once or twice; they are rarely ongoing; and they tend to be poorly attended.

Lecture and discussion groups Lecture/presentations, seminars, and discussion groups are commonly mentioned as HIV/AIDS education and awareness activities. Details about the content of these programs are rarely provided in the literature. In isolated cases, companies operate health education programs that include family planning; some companies have had discussion groups dealing with gender inequality and discrimination, nutrition, stress and alcohol abuse.¹⁰⁷

Media presentations Companies use a broad variety of media communication programs to educate and develop awareness of HIV/AIDS. The type of program adopted correlates with the rank and education level of the employee. For workers who are illiterate or semi-literate, folk and electronic media presentations are common. These include videos, puppet shows, dramatic productions, songs/choirs, and traditional dance groups. Such methods have been effective as communication tools and sources of entertainment in campaigns dealing with other health matters. A number of companies have printed and distributed a cartoon booklet produced by David Whitehead Textiles of Zimbabwe, for their semi-literate and literate employees.¹⁰⁸

Printed material is more common for skilled employees and management. Poster displays and brochures may be available at the health clinic, and the company may print and distribute a free monthly or quarterly HIV/AIDS newsletter.

HIV/AIDS education programs for new employees These activities are often part of the induction or orientation courses for new employees. They consist of lectures, seminars, discussions, or media presentations, often with an HIV/AIDS education component included.

General work place HIV/AIDS education and awareness programs These programs typically have been organized by peer educators, company nurses or human resource personnel. They range from regularly scheduled discussion groups to media presentations and one-time AIDS awareness activities during National AIDS Week or on World AIDS Day. General employee programs are often held during lunch or tea breaks, so as not to cut into work time. Attendance is voluntary but the company may provide refreshments to improve participation. Only occasionally are supervisors encouraged to attend and/or lead discussions.

HIV/AIDS programs also have been incorporated into ongoing company training sessions. In some companies, AIDS education outreach programs are made available to employee dependents and/or members of the surrounding community.¹⁰⁹

Education of medical and/or human resource development personnel Programs in this category involve sending relevant staff on training courses. The training typically covers methods of creating AIDS awareness, peer education, pre-and post-counseling techniques and the development of an in-house HIV/AIDS education program. It is usually assumed that such training will lead to the implementation of more broad-based work place interventions. The correlation between the two, however, appears to be weaker than might be expected. .

Education programs oriented specifically for company managers and/or supervisors Such activities are not common. While all companies recognize that the loss of skills at senior levels can be highly disruptive, very few of them report HIV prevention initiatives for senior staff.¹¹⁰ When such programs occur, they are usually held at the work place and are organized by the human resource development officer, sometimes with the assistance of outside experts. The focus is AIDS awareness, including a basic understanding of HIV and AIDS, and acquaintance with national statistics on HIV/AIDS prevalence. Programs include one-day seminars and one-time courses for supervisors. For management, the activities are often confined to special sessions during National AIDS Week or to celebrate World AIDS Day. Briefings to management on the company's prevention program (as a means of encouraging management acceptance, knowledge of, and continued support) have been limited.

Many companies tend to assume that if management is familiar with statistics about the incidence of HIV/AIDS, there will be support for prevention activities. There is little evidence to substantiate this view.¹¹¹

HIV/AIDS Counseling, STD Testing, and Treatment Some companies offer free or affordable HIV/AIDS counseling, as well as testing and treatment for sexually transmitted diseases. The services are often provided in-house and on a voluntary basis at company clinics. Some work places also offer voluntary testing and treatment for sexually transmitted diseases and opportunistic infections such as tuberculosis. Others offer this service for the employee's sexual partner if the latter takes the initiative to come to the company health clinic. Some mining companies have provided testing and treatment to commercial sex workers within the community adjacent to the mine.¹¹² Other companies will also cover the salary of employees when they participate in treatment programs. In one instance, a company clinic arranged for employees to visit a traditional healer and receive traditional medicines during working hours.¹¹³

Distribution of Male Condoms Probably the most widely adopted work place intervention is the distribution of male condoms. Practices vary widely as to whether they are distributed free of charge, or at low cost. Most frequently, condoms are obtained from donor agencies at a minimal charge or supplied by the Ministry of Health at no cost. Condoms are often available through dispensing machines at company stores, rest rooms or clinics. Otherwise, they are available through the company nurse or peer educators -- sometimes on a limited basis. Regardless of how the condoms are distributed, demand for them has been consistently high. Companies in urban communities often do not distribute condoms if they are readily available, reliable and affordable in the surrounding community.

It should be noted that the literature does not provide any evidence that companies have made female condoms available to their employees. Those are typically distributed through donor-supported social marketing projects.

Control of Organizational and Environmental Factors Increasing the Risk of HIV Diminishing the organizational aspects of employment and the environmental factors that increase risk of HIV can be highly effective. One company that has shown this is the Jwaneng Mine, Debswana, Botswana.¹¹⁴ In former times, employees were provided with room and board with no provision for their families and/or partners. The company now offers employees shared, self-catered housing, and permits spouses to live with the employee.

Major development projects often require that large numbers of male workers live apart from their families for extended periods of time, thus increasing the risk of HIV/AIDS from commercial sex. Companies and/or donors can reduce this risk by redesigning these projects by creating special villages where workers can live with their families.¹¹⁵

Another concern relates to work places such as hospitals or laboratories where there is a risk of contact with contaminated blood. Special precautions are needed to raise the awareness of all employees to the safety issues involved.

In-Kind Services Some companies will contribute in-kind services such as food and beverages to enhance and encourage participation in their HIV/AIDS education programs. Most will also grant workers permission to attend programs during working hours. Occasionally companies will provide transportation for HIV/AIDS activities.¹¹⁶

b. Cost Avoidance and/or Cost Reduction

The most widespread work place intervention used by businesses in SSA has been to avoid or reduce the probability of hiring an employee who is HIV positive, or from a group “likely to get AIDS.” Realizing that employees can easily contract HIV once they are on the payroll, companies will often combine this strategy with the reduction of benefits available to infected workers.¹¹⁷ Such strategies are illegal and discriminatory and are frequently neglected or avoided in the literature. Nonetheless, they tend to be pervasive.

What is not clear from the sources is whether the interventions described below have been instituted as a direct response to HIV/AIDS, or to other economic concerns. There have been numerous crosscutting themes. In many countries in SSA, the dramatic rise in HIV/AIDS infections has coincided with rising labor costs, affirmative action, sharp increases in health care costs, and exposure to competitive global markets. Regardless of the cause of these interventions, the effect on employees remains the same.

Companies Avoid Hiring Infected or High-Risk Employees Pre-employment medical exams routinely have been a condition for job applicants. Many companies now use these obligatory exams to screen for HIV and other infections such as tuberculosis, malaria, and so on. Applicants found to be HIV-positive are told that they fail their interviews.¹¹⁸ Many managers do not seem to be aware that pre-employment HIV testing violates the 1988 WHO/ILO guidelines on non-discrimination against workers.

Similarly, HIV screening is often camouflaged within the regular, long-standing medical examination procedures required for older employees. Those who fail are dismissed.¹¹⁹ Labor legislation in South Africa currently provides that incapacity and debilitation for any cause can be treated as grounds for dismissal.¹²⁰

As a matter of policy, business organizations claim that there is no mandatory HIV blood screening for potential employees, and that employees who are infected with HIV remain in employment until such a time when they develop full-blown AIDS and cannot continue working. The situation differs in practice. Uganda’s National Organization of Trade Unions (NOTU) has claimed that some employers subject prospective employees to a “quiet” HIV screening test before recruitment while others do it openly. In a survey of eighteen firms in Zambia, fifteen used medical examinations to screen for HIV in new job applicants and old employees alike.¹²¹

NOTU also reported that most employees who have HIV/AIDS do not retain their jobs – a finding that other researchers have verified. Although there is some indication that firms are less likely to dismiss or replace middle and senior-level managers, there have

been some examples.¹²² Some research indicates that employees who are chronically ill are advised or coerced into retirement “on medical grounds.”¹²³ According to NOTU, other workers leave their job due to fear of isolation by other workers. This saves the company medical and possibly funeral expenses. Furthermore, although organizations claim that there is no job insecurity for employees who develop AIDS, once sick leave has expired many workers are laid off.

NOTU also found that the Structural Adjustment Program in Uganda was used as an excuse for dismissing staff.¹²⁴ Although laws protect workers who are HIV-positive from being summarily fired, the economic recovery programs often pre-suppose retrenchment as part of the restructuring of industry. Many companies have dismissed HIV infected employees under this guise.

Modified Benefits Many employers have been reducing their benefits to employees and their dependents. One such practice is to externalize medical costs by making employees pay for more of their medical care expenses, such as those of their dependents. Other companies, such as Quick Print, in Botswana, will not pay medical expenses for any illnesses specifically related to HIV/AIDS.¹²⁵ In at least one case, medical loans to employees have been recovered from their salary or terminal benefits.¹²⁶

Other companies use their life insurance benefits for employees as a mechanism for determining whether to invest further in their mid- level and senior employees. To receive more insurance coverage, a medical exam is required that includes a test for HIV. Employees who will not be tested, or those who fail the exam, are denied further training and promotion.¹²⁷

With pension funds and other benefit schemes threatened by early depletion, some companies have introduced new funding arrangements for employees hired after a certain date. These new pension and benefit funds are employer-managed individual retirement accounts, with benefits based on the contributions made into it over the period of employment.¹²⁸ In other cases, it is the health insurance providers who are reducing their ceilings for HIV-related claims.¹²⁹

“Counseling” Employees who are known or suspected of being HIV positive are “counseled” to retire.¹³⁰ In most companies, early retirement is synonymous with discontinued medical aid and life insurance. However, since employees are aware of this, most will opt to stay on the payroll, and make every effort to show up at the work place so they cannot be dismissed. Cases have been reported of employees being carried to work.¹³¹

Modification of Funeral Ceremonies In instances where employees live on company estates, managers have been insisting that funerals be held on weekends to reduce absenteeism. Furthermore, official company mourners are being chosen from those employees who are off-duty on the day/s of the funeral.¹³²

Out-Sourcing Production Activities Some companies have begun to control the organization of the work place in ways that will decrease the risk of HIV. The most

common means of doing so is to out-source production activities, particularly where those activities involve workers in high-risk groups. Transportation and logistics are examples. One large company in South Africa dissolved its shipping department and hired independent contractors as truck drivers. This avoided paying benefits (which had been rising rapidly) to its drivers.¹³³

Evidence shows that companies are also increasingly hiring staff on casual or rolling short-term contracts, thus decreasing the need to pay medical, disability, or terminal benefits.¹³⁴ Other companies are eliminating their unskilled workforce entirely, as the same services can be secured at a lower cost from outside contractors.

Shifting to Capital-Intensive Production Technologies Where feasible, companies have considered the benefits of shifting from labor-intensive to capital-intensive production technologies.¹³⁵ As losses from HIV/AIDS increase, those businesses with large numbers of unskilled and semi-skilled laborers, such as commercial farms or mines, have begun to mechanize.¹³⁶

c. Adjustments to Employment, Training and Benefit Schemes

Some companies are exploring, or have put in place, extra recruitment, training and benefit options. These include additional hiring, increased insurance coverage for key positions, multi-skilling strategies, and ‘succession guidance’ and training. The literature does not note specifically that these training and employment schemes were developed in response to the rising incidence of HIV/AIDS. On the contrary, many were ongoing company programs, or were adopted as part of downsizing.¹³⁷ Nonetheless, they have been well-suited for dealing with the effects of HIV/AIDS in the work place.

Additional Hiring In contrast to the point made earlier about capital intensification, some companies have found it useful to adopt more labor-intensive production methods. Two or three people have been employed to operate machines that would normally require only one person. The redundancy reduces the risk that if one of these people becomes ill or dies, the work schedule can be maintained.¹³⁸ For semi- and unskilled positions, some employers have begun to recruit additional employees, or to retain a pool of contract employees to substitute for those on prolonged sick leave.¹³⁹ Others, such as British Petroleum and Barclays Bank, have begun the practice of “double-hiring” for key, skilled positions.¹⁴⁰ Although this adds to costs, it insures that the company will not have to close down temporarily or disrupt its operations while recruiting a replacement.

Increased Insurance Coverage In industries where the loss of one highly skilled employee could threaten the whole production process, companies have purchased “key man” insurance to cover the costs of recruiting replacements if they die.¹⁴¹

Multi-Skilling Strategies As companies experience, or foresee, gaps in their production or services due to increased illness, they are devising strategies to widen the skill base of their employees. One such strategy is to promote multi-skill training at most levels of their operation.¹⁴² Employees are usually trained in-house to acquire a broader range of

skills that will enable them to fill important gaps as the need arises. This flexibility often works to the advantage of the employee, who then has a greater chance for promotion.

Succession Guidance and Training Numerous strategies have been developed to address losses of experienced labor by combining career counseling with in-house training or apprenticeship programs.¹⁴³ These schemes vary considerably in their application. In Botswana, the Sanitas Garden and Nursery Centre has organized a tabular training form for each department with a list of skills and product knowledge for each position. This informs employees of the skills they need to move to different positions. Each skill has an identified trainer. Employees shadow them to learn the job. Employees are encouraged to map out a plan for their own career development, and training is offered to those who are most highly motivated.

Other companies have adopted multi-tiered succession plans for identified positions within the company.¹⁴⁴ For each designated position, several potential successors are identified and the necessary skills are outlined. Employees are encouraged to take the initiative to acquire the necessary skills through training programs offered at the company, or elsewhere. This promotes a healthy atmosphere of competition within the company while simultaneously offering career path counseling for employees.

The Botswana Development Corporation has adopted a plan that combines training and lost work time strategies with succession planning, but with compensation rather than competition as an added incentive. Certain positions have a nominated assistant, who is usually in the grade immediately below. This “assistant” is trained on-the-job to learn the responsibilities of their designated superior. If the latter is absent, the “assistant” will act on their behalf, and continue his/her own job as well. Special pay is provided to compensate for this doubling up.

In other companies, the in-service and on-the-job training programs have been expanded to encourage employees to broaden their skill base, but a formal career path is not outlined.

d. Other (Socially Responsible) Interventions

The majority of these interventions relate to circumstances where the employee already has HIV. Rather than seek to deflect the costs involved, a number of organizations have adopted initiatives that support and sustain their workers.

Assurance of Care and Non-Discrimination Companies support employees infected with or affected by HIV. This enables them to receive appropriate counseling, medical and social support. They also ensure that top management enforces non-discrimination policies regarding HIV/AIDS, and that there are clear procedures for dealing with personnel issues such as job termination.

Adjustments to Employee Benefits Company-provided benefits and programs have an important role in preserving the dignity of employees who are HIV positive, or who are

suffering from AIDS, by helping them maintain normal, productive lives for as long as possible. Some companies are restructuring their insurance policies and benefit packages to meet the needs of terminally ill workers and their families without bankrupting the company.¹⁴⁵

Examples include the extension of medical insurance to include coverage of HIV/AIDS, and the introduction or enhancement of occupational health clinics, pension funds, death benefits, funeral transportation and other costs, and subsidized loans. Other companies have agreed to pay terminal benefits to employees who are certified as terminally ill, so employees can “retire” to die in peace, without losing these benefits.¹⁴⁶

Hospice Programs A number of companies have established facilities for home-based care and/or home visiting of ill people while others have provided training for families in home-based care by company medical personnel or through contracts with other health and/or Red Cross staff.¹⁴⁷ In some cases, the company has provided financial support to community home-based care schemes. (This has usually been limited to community-based industries.) In other cases, the human resource personnel organize volunteers to operate hospice programs in support of colleagues who are ill.

Company Foundations and Fund Raising Efforts Several companies have set aside special funds for combating AIDS. Examples are Zimbabwe’s Southampton Life and Defy Industries, and South Africa’s ALUSAF (Billiton Bayside, Hillside Aluminum). Southampton Life has an obvious strategic interest in dealing with AIDS. It has established a small foundation. Defy Industries has organized fund raising to provide terminal care. Another group of companies in Zimbabwe is reported to be establishing a trust to support local hospitals.¹⁴⁸

Return-to-work programs As an alternative to forcing or encouraging employees with HIV/AIDS to retire or resign, some far-sighted companies have designed flexible “return to work programs” which identify new job placements for these workers who are unable to fulfill the requirements of their former positions.¹⁴⁹ The company will also provide them with the necessary training. Although this option is costly, it represents an explicit attempt to allow the worker to continue contributing in a productive way.

3. Criteria for Developing Work Place Interventions in Response to HIV/AIDS

The following criteria refer to a broad range of business enterprises within the formal sector. They range from large agricultural estates and mining companies to smaller commercial firms and public agencies. They also draw in part from the extensive data available related to HIV/AIDS activities in private and public enterprises in the United States, and from literature concerning educational awareness campaigns and public health programs.

All work place interventions should be proceeded by a planning process

A planning committee should include representatives from management, employees, labor unions, the health profession, and local AIDS service organizations such as NGOs. Whenever possible, it should also seek the collaboration of employees who are affected by HIV/AIDS. Guidance should be sought from outside organizations such as the Ministry of Health, the National AIDS Coordination Program and the World Health Organization. The planning process should emphasize dialogue between employees and management rather than a top-down approach. The planning exercise cannot be a one-time event; it needs to be ongoing.

Critical dimensions considered should be the initial identification of circumstances in the work place that result in HIV infection, company-specific obstacles and opportunities, and priorities for action. This approach will help ensure that the program is designed according to local need, and not externally driven based on available funding or donor interest. The objective of the planning process should be the development of a comprehensive HIV/AIDS policy and an HIV/AIDS awareness and education program.

All HIV/AIDS programs or interventions should be guided by an HIV/AIDS policy

Desirable features for a HIV/AIDS policy include:

The policy statement should be a written document.
It should include measures for communicating its contents to all employees.
The company's position in respect to HIV and AIDS should be clearly stated.
Activities proposed should reflect a commitment to the principles of equity, confidentiality, non-discrimination, and medical accuracy.
The policy should be consistent with national HIV/AIDS policies and labor laws, and SADC guidelines.¹⁵⁰

An HIV/AIDS education and awareness program should be developed

An effective HIV/AIDS education and awareness program will have several features. It should:

- be ongoing
- include a built-in system for program monitoring, evaluation and updating
- be adequately funded
- address prevention, control, and management of HIV/AIDS
- include formal and informal education programs about HIV/AIDS
- include input and/or involvement of staff members living with HIV/AIDS
- involve peers, since they are the most powerful agents of change
- require the mandatory participation of all employees
- include the continuing engagement of management
- extend beyond the work place to include the local community, where appropriate

Programming needs to be comprehensive

Research shows that HIV/AIDS information alone is not sufficient to change behavior that predisposes individuals and groups to HIV infection.¹⁵¹ The information provided needs to be placed in context. This implies that work place education and awareness programs need to go beyond information about HIV transmission, safe sex alternatives, condom availability, STD treatment and medical care, and HIV testing and counseling. They must also include information about alcohol and drug use, gender inequality, and violence against women.

Programming should be sustained and supported

Work place education programs should be reviewed regularly and updated in order to maintain accurate, current information, and to encourage continued participation. Likewise, peer educators should be provided with on-going or repeat training, and incentives or additional forms of motivation in order to maintain their interest and energy.

In practice, employers tend to expect far too much of peer educators, since their regular employment requirements are rarely reduced. If peer education programs are scheduled for evenings, this absorbs the employee's own time, is generally uncompensated, and takes away from time with their family. Moreover, it is invariably difficult for educators from a lower level in an organization to educate those at higher levels. Consequently, management rarely benefits from these programs. It is one reason why company managers are indifferent to these programs. Furthermore, since peer educators are often trained by outside agencies, managers tend not to take them seriously and do not provide them with adequate resources. If peer education programs are used, they need to be sustained and supported from the highest levels of the enterprise.

Programming should be regularly monitored and evaluated

The effectiveness of any work place intervention is increased if it is regularly monitored and evaluated. Important objectives include the increased involvement of employees in HIV/AIDS programs, measurable decrease of drug and alcohol use, and demonstrated continued support from senior management.

Executives need to be engaged and committed

Without commitment at the highest level, HIV/AIDS policy and interventions will not be taken seriously. Every enterprise needs to have executive involvement in the HIV/AIDS policy planning and programming. When managers do not participate in these programs they provide a powerful signal to employees, potential investors, and the general public. They show that the company is not willing or able to address the types of socioeconomic issues that will affect its bottom line and long-range effectiveness.

Programming should be sensitive to the considerations of the target audience

Where appropriate, education programs should be held in the local language.¹⁵² The timing of these programs should take into consideration the employee population and their spouses/partners. If women are one of the target audiences, programming should not take place during cooking hours, or late in the evening when women are occupied caring for young children. Furthermore, where information is provided by media presentations, there should be interactive follow-up discussions between the presenters of the program and the target audience. This helps insure that the issues are well presented and are properly understood.

HIV testing and/or screening, if undertaken, should be within specified guidelines

If employees are tested for HIV status, the results should remain confidential. Counseling should precede any disclosure of HIV status. Those employees who wish to know the results of HIV testing should be provided with accurate information and, if necessary, counseling. Employers should not require HIV screening as part of general work place physical examinations or recruitment. When testing is offered, it should be voluntary, informed, and confidential. Employers who insist on HIV testing before recruitment should openly state the requirement in the job advertisement.

4. Concluding Comments

My review of the literature on work place interventions in response to HIV/AIDS has revealed a number of features. For a start, there has been an encouraging rise in the scope and variety of work place interventions. As more information is disseminated about the epidemic and its effect on the labor force, and as more examples of successful activities emerge, additional companies will begin to tackle the problems involved. It is reassuring that among the earliest enterprises to adopt such programs are mining and agricultural communities and trucking firms, where the incidence of HIV/AIDS is the highest. As evident from epidemiological studies of HIV, early intervention, especially among high-risk populations, is critical for reducing the rate of infection.¹⁵³

Data on work place interventions are limited and highly selective. Since the collection of more accurate data about HIV incidence in response to work place interventions would conflict with the need to maintain confidentiality, this situation is unlikely to change dramatically. The lack of data inhibits the type of analyses that can be undertaken and hence the type of assistance that can be offered. Without longitudinal studies, the effectiveness of the different types of assistance is also hard to determine.

AIDS education and awareness programs are among the most common work place interventions. With the assistance of non-government organizations, these programs are also among the easiest to design and implement. AIDS education does not necessarily correlate with the adoption of preventive measures at the individual level. Even a little education, however, is far better than none at all.

Notwithstanding the large amount of literature on work place interventions, it needs to be understood that the predominant means of gathering data has serious drawbacks. One-time interviews have specific biases. These show up in discrepancies between the information provided by the interviewee and the activities as they are implemented in practice. Furthermore, in the absence of evidence from longitudinal studies, it is difficult to conclude that the interventions are effective.

Such limitations have led to the emphasis on “best practice” profiles and surveys. These provide only selective information since they give no indication to the number or nature of work places that do *not* have interventions. Furthermore, there is no way of understanding *why* such interventions have not been adopted. The information gathered through these surveys represents company actions at one point in time. It cannot be assumed that the interventions are either ongoing or effective. Moreover, the “best practices” may not be feasible under particular circumstances. In the case of HIV/AIDS, even a partially effective practice is better than none at all.

Finally, it is hard to judge what “best practices” imply under circumstances when labor legislation and HIV/AIDS codes are non-existent or not enforced. For whom are they “best practices” -- employees (both skilled and unskilled)?; employers?; medical specialists?; and/or society as a whole? Although the literature to date provides much valuable information, it needs to be recognized that much relevant information on the effects of HIV/AIDS and ways to ameliorate them remains unavailable.

Work place interventions in SSA can vary within one company according to the status and skill level of the employee affected. These interventions intersect on a number of levels: practice, cost, and ethics. Due to the rising cost of dealing with HIV/AIDS, discriminatory practices are likely to increase. By their actions, many companies have already determined that the value of preventing new infections or prolonging lives is not worth the cost for their less skilled employees since they are easy to replace. In these cases, companies are more likely to use strategies such as outsourcing, multiple hiring, and multi-skilling. By contrast, the same companies may conclude that life-extending antiretroviral therapy is cost-effective for highly skilled employees whose short term contributions are critical.¹⁵⁴

It is the exception when companies to look beyond prevention or avoidance strategies and consider more humane methods of dealing with the consequences of HIV/AIDS in the work force. Little, for example, has been done to address, or even think about, the larger psychological, demographic or educational issues related to AIDS and the work place. Furthermore, there is little indication that businesses are considering interventions based on perceived changes in market conditions, declining levels of employee motivation and morale, or counter-productive (opportunistic) behavior. Business leaders have generally shown little willingness to confront the broader implications of a working environment where employees' productive lives are being dramatically foreshortened. Neither does it seem that they have faced the reality of operating within economic systems under stress

when the very people who are needed to overcome the difficulties are also under stress from declining income and disrupted family circumstances.

Another feature of the literature is the general absence of innovative or imaginative long-range action to deal with the capacity problems associated with the spread of HIV/AIDS. Capacity building efforts across Africa continue to be undermined as the epidemic intensifies.¹⁵⁵ Firms that have routinely invested in expensive, long-term overseas and regional training for their employees need to recast their efforts and replace them with numerous opportunities for short-term and flexible on-the-job training. The aim should be to enhance the supply of workers with the versatility and skills needed to cover the gaps left by the workers who have died. To date, the only interventions that begin to approach this type of thinking include job understudies, multi-skilling, and succession training. The need for more horizontal and vertical flexibility among employees will become increasingly pressing.

At least two significant populations have been overlooked in the work place interventions reviewed in this survey. The first is employees who are retirement age and are HIV-negative. The second is female employees. Often it is the older employees, or recently retired workers, who are adversely affected -- financially, socially, and emotionally -- by the spread of HIV/AIDS. They could directly benefit from additional income to care for their family members who are suffering. The benefit of encouraging later retirement among this group, or re-hiring them, is an option that has been given little attention. Businesses may want to reconsider existing retirement ages by building in incentives for older workers to remain in the work force, and to encourage recently retired, but still productive, workers to return. Although some forward-looking work places have designed "return-to-work" programs for employees suffering from AIDS, similar programs should be considered for those who have retired.

Despite the increasing awareness of the inequities experienced by women over the past decade or so, the concerns of women have been largely neglected in the design of HIV/AIDS work place interventions. An obvious example is that while male condoms are widely available, female condoms are not. Women are at higher risk of HIV infection than men, and yet the social and cultural factors which put them at greater risk have been neglected in work place AIDS education and awareness programs. Violence against women, and the relationship of this violence to HIV/AIDS, has received far too little attention.¹⁵⁶

None of the interventions outlined in this survey represents a response that addresses long-term, skill-deepening requirements. The assumption was that skilled workers can be obtained from "outside" the firm or organization. This assumption is no longer valid. The prevalence of HIV/AIDS is so high across Southern Africa that there is effectively no "outside." Moreover, local employees who would normally succeed to skilled positions tend to be contracting HIV earlier in their careers and are soon lost from the work force.

All work place interventions that reduce HIV and counteract the effects of AIDS need to be encouraged. Better data may indicate that they are far more successful than the limited literature indicates. The data that are available show that increasing numbers of companies have begun to respond to the problems posed by the spread of HIV/AIDS. What is needed, however, is an even greater willingness among managers and supervisors to confront the implications of the losses being incurred when workers become debilitated and productivity declines. The measures outlined in this review indicate the types of changes that enterprises have made. The remaining challenge is to devise ways of creating the conditions that will encourage these (and other constructive) measures to be universally adopted.

Annex B

Framework for Thinking About Labor Force Issues in Response to HIV/AIDS in Southern Africa

by

Donald R. Snodgrass

Labor force participation is high in Sub-Saharan Africa, even by conventional measures which undercount the contributions of women. Moreover, most labor force members are actively employed in some form of production, rather than being unemployed. In the early 1990s, 68% of working-age men and women were in the labor force¹⁵⁷. Of these, 94% were employed and only 6% unemployed. Relatively few of the employed, however, held wage jobs. Ten percent of the employed held wage jobs in the service sector, 6% worked for wages in agriculture, and only 3% had wage employment in industry. A much larger number -- 81% percent of the employed, or 76% of the labor force -- were self-employed or served as unpaid family workers (see table).

Distribution of Employment in Sub-Saharan Africa, Early 1990s (% of total)

SECTOR	WAGE EMPLOYMENT	NONWAGE EMPLOYMENT
Agriculture	6	59
Industry	3	6
Services	10	16
Total employed	19	81

Source: Adapted from Lindauer (1995).

Economic decline in many African countries has been associated with the expansion of the informal sector. This implies that the share of wage employment in total employment in most countries is even smaller now than it was in the early 1990s.

Somewhat more than one-half of all formal sector workers are government employees. Government employment (including all levels of civilian employment and all parastatals but excluding the military) ranged from 40 to 75% of formal employment in several Sub-Saharan African countries back in the 1970s¹⁵⁸. Although these employment statistics are incomplete, dated, and approximate at best, the employment structure across Africa has changed very slowly over time. Thus, it seems likely that 10% or so of all workers and

more than half of wage employment are in the public sector, with a slightly smaller percentage in private wage employment.

Sector shares of income generation and production are very different from those of employment. There are large differences in output per worker among and within sectors between formal and informal modes of production. The average wage worker has a productivity level several times as high as that of the average non-wage worker. Accordingly, the shares of GNP produced by wage workers are much larger than their employment shares. Precise estimates are hard to come by, and data are becoming even scarcer as national statistical offices lose staff to HIV/AIDS. Most likely, however, the formal sector, which generates less than one-fifth of total employment, produces one-half or more of GNP.

Even before HIV/AIDS became widespread, labor productivity in the region was low and growing very slowly if not stagnant or negative. Output per worker in most African economies was lower in the early 1990s than it had been in 1980¹⁵⁹. In many cases, it was lower than it had been as far back as 1965. Labor force growth in 1965-93 was rapid, averaging about 3% per annum. This growth rate was similar to that pertaining in the Middle East and North Africa as well as in Latin America and the Caribbean. (Labor force growth was slightly slower in South Asia and in East Asian and the Pacific.) Annual GNP growth, however, averaged less than 3% in Sub-Saharan Africa, compared to 4% or more in other regions. Thus, the low GNP growth in Sub-Saharan Africa during this period was derived from increases in the numbers of workers, not from growth in output per worker. In 1994-97, there was some improvement in the region's economic growth but little acceleration in employment creation¹⁶⁰.

The HIV/AIDS epidemic hit Africa in the early 1980s. By 1999, 23.3 million adults and children were living with HIV or AIDS in SSA (UNAIDS 1999). This represented more than two-thirds of the global total of 33.8 million cases. The adult prevalence rate was estimated at 8%, by far the highest in the world. In no other region was it as high as 2%. In some countries of SSA, and certainly in certain socioeconomic groups, prevalence is 15-25% or even higher.

HIV/AIDS in Africa is spread primarily through heterosexual contact. Fifty-five percent of HIV-positive adults are women who tend to contract the disease at younger ages than men. This is a manifestation of women's lack of power in negotiating sexual contact and the poverty that induces young girls to enter into "sugar daddy" relationships with older men. The epidemic has severely affected all levels of society. The educated middle class is at least proportionately impacted and may have been hit even harder than the poor. The epidemic is still growing; new infections in 1999 were twice as numerous as deaths. Although 13.7 million Africans have died already, more than half of those currently infected (another 12-15 million) can be expected to die in the coming decade. Life expectancy at birth in southern Africa, which rose from 44 years in the early 1950s to 59 in the early 1990s, will probably fall back to 45 by 2010 because of AIDS¹⁶¹. The concentration of the epidemic on young adults has created millions of AIDS orphans and will undoubtedly result in a drop in the growth rate of the labor force.

Following infection with HIV, an individual typically has six years or so before he or she becomes sick with AIDS. During this period, the infected person may or may not know that the disease is present. Physical and mental abilities are not impaired yet, but one's morale may begin to suffer. Once symptoms of AIDS begin to appear, the patient becomes increasingly incapacitated and able to work less effectively and for shorter periods of time. Death commonly occurs within one year of the onset of AIDS.

Two points in this sequence have economic significance. First, when the individual realizes that he or she has a disease that will prove fatal within a few years, that person's time horizon shortens. Economic behavior can be expected to emphasize the short run and pay less heed to a longer run that the person will not live to see. Likely results are decreased work effort and lower savings. The second important point, which appears much later, comes when physical and mental capacity decline and continuous medical care is required. At that point, productivity begins to diminish and the question of how to finance medical care must be faced. The AIDS-infected worker's contribution to productive activity falls as his/her strength ebbs and absenteeism rises.

Economic losses incurred from HIV and AIDS are substantial but difficult to quantify. The nature and amounts of loss vary considerably in type and magnitude among sectors of the economy. In own-account agriculture and informal sector activity, little impact would be expected until AIDS-related illness strikes. After that, work previously done by adults who have now become sick must be taken up by others, most often children and the elderly. Alternatively, the work may simply be left undone. Time and energy must be reallocated from other activities, at some opportunity cost. To the extent that labor supply is lacking or productivity falls, the family's income level will decline. Household expenditure may also be diverted from other types of expenditure to medical care, but only to the extent that such care is available, utilized by the family, and requires payments of fees. Most likely at this level of society, relatively little medical treatment will be utilized. After the death of a young adult parent, responsibility for raising orphaned children usually falls on surviving relatives. Their family size increases, reducing both per capita consumption and household savings.

Agriculture and the informal sector use far smaller amounts of human capital than formal sector activities. Many African farmers are illiterate and few people with post-primary education work in agriculture. Nevertheless, productivity is likely to decline as experienced farmers are replaced either by old people whose skills are outdated or by inexperienced young people.

In wage employment, education and training are important means of raising productivity. High rates of return to investment in education have been calculated for African countries, although the validity of these estimates recently has been questioned¹⁶². Investment in education is highly sensitive to life expectancy¹⁶³. Shorter life expectancy greatly reduces returns to investment in education, particularly for the more expensive forms of investment, such as higher education. With life expectancy declining because of AIDS, investment in education becomes a far less attractive proposition in SSA, both for

individuals and governments along with other sponsoring bodies. Yet skills are still needed to operate public and private enterprises and institutions. The most important form of adjustment to shortened life expectancy would be to invest smaller amounts in skill formation for larger numbers of people. Ways must be found to keep productive enterprises working after key employees become incapacitated or die.

As shown by recent research on several firms in South Africa, the epidemic is imposing significant costs of different kinds on modern sector firms¹⁶⁴. Organizations that have provided generous health, retirement, and death benefits are finding that they must cut back on such benefits to avoid ruinous increases in their costs.

Faced with a rising death rate and shortened life expectancy among their employees, formal sector enterprises and organizations are likely to cut back on training and employee benefits. Large firms often pay a premium over the market wage as a way of attracting high-quality employees and reducing labor turnover. As a result, when they have job openings they are typically flooded with applicants. These employers may also feel that paying a higher wage increases productivity as employees are better fed and more highly motivated. When HIV and AIDS appear as a factor that lowers productivity, it may become impossible to maintain such a wage policy. Wages and benefits are likely to decline with deleterious effects on consumption and savings. This in turn may contribute to a downward spiral in which demand for a firm's products falls and further contraction ensues.

Another likely reaction is that firms will attempt to substitute capital for labor. After all, machines do not contract HIV/AIDS. But there are serious limits to the feasibility of this reaction, which is not socially desirable when there is high unemployment. As their profitability falls, firms have fewer financial resources with which to buy machinery. If demand for their products declines, they may be willing to reduce their capacity, rather than maintaining or increasing it through capital investment. Finally, operating machinery effectively requires skilled engineers and technicians. Given the scarcity of such skills in most African countries and high prevalence of HIV/AIDS at all levels of society, the attempt to escape the epidemic's impact on the cost of production through capital intensification may well prove futile.

New approaches are needed to deal with this complex problem. During the period after an employee learns that s/he is HIV-positive but before s/he becomes ill, the main problem is one of motivation. Ways must be found to harmonize the motives of the employee with those of the employer to the extent possible. Later on, when sickness occurs, there are two major problems. The first is how to meet whatever responsibility the employer is willing to accept for the maintenance and care of the sick employee. The second problem is how to compensate for the sick worker's declining contribution to production.

Education and training must be important elements in any solution because formal sector employers must find ways to replace the skills lost to AIDS if they are to maintain current production levels, let alone bring about economic growth. Schooling provides a general

base that has demonstrable economic benefits. More specific skills are better learned in the workplace. Even without the AIDS problem, employers have little incentive to provide such training because labor turnover can make it difficult to realize the benefits. AIDS heightens this problem by making it still less likely that firms will be able to enjoy the benefits of staff training activities. Even without AIDS, cost-sharing mechanisms such as training funds managed by the government or industry groups are needed to encourage such training. Shortened life expectancy lowers the returns of training, so as HIV/AIDS intensifies it is likely that greater government involvement and/or inter-firm cooperation is needed. Promotion of basic education to provide the labor force as a whole with skills that can be used in a wide range of settings (e.g. computer literacy) is more important than ever. Ways must also be found to encourage firms or industry groups to offer the kind of training that provides large numbers of people with relevant, usable skills.

Annex C

Zambia Model Update: Life Expectancy, Investment, and Income Growth

by

Malcolm McPherson and Tzvetana Rakovski

1. Introduction

This annex reports econometric estimates of the impact of HIV/AIDS on economic growth in Zambia. The results have been obtained from an existing econometric model¹⁶⁵ that we modified to highlight the influence of HIV/AIDS. The original model explained income growth, government revenue, agricultural output, inflation, the nominal exchange rate, import demand, and mining output.

To enable us to focus on the impact of HIV/AIDS, we modified the specification to include the effects of changes in life expectancy at birth, the dependency ratio, and the rate of growth of the labor force. We have also added the growth of investment to include an element that is fundamental to the endogenous growth model discussed in the text. The re-specified model has equations for income growth, investment, the exchange rate, and inflation. Both theory and experience have shown that there is a strong positive link between increasing life expectancy and economic growth.¹⁶⁶

Over the last decade, a strong link was evident between the spread of HIV/AIDS and reduced life expectancy. In Zambia's case, this relationship was confounded somewhat by the sharp decline in real per capita income and reductions in economic welfare. Zambia experienced a significant increase in infant mortality even before the rapid spread of HIV/AIDS.¹⁶⁷ This adverse trend implies that the results reported below will need to be interpreted in the context of Zambia's acute economic problems.

Yet, even with this qualification, the model we use helps to unravel some important macroeconomic relationships, particularly with respect to the links between economic growth and changes in key social indexes that can be directly tied to the spread of HIV/AIDS.

Though the simultaneous equation system we estimate is not a strict application of the endogenous growth model discussed in the text, the system includes the basic elements of such a model. As such the results shed light on the non-linearity of the growth response associated with the spread of HIV/AIDS.

2. Data: Description and Sources

For all variables, the data source is the World Bank Africa 2000 CD-ROM database. The data cover the period from 1967 to 1998. Taking first differences and lags into account, there are 30 observations.

Most of the variables have been defined in descriptions of the broader model.¹⁶⁸ Three new variables have been added -- life expectancy at birth, the dependency ratio, and the growth of the labor force. Life expectancy is measured as the average number of years that a person is expected to live given prevailing age-specific rates of mortality. Because data have not been reported for every year over the period we are analyzing, the missing observations have been derived through interpolation. The dependency ratio is defined as the number of dependents divided by the working-age population. Missing observations in this series were also obtained by interpolation.

Real income and investment are measured in billions of kwacha in constant prices. The exchange rate is measured as kwacha per US dollar. An increase in the exchange rate represents a devaluation of the kwacha. Domestic inflation is measured by the change in the consumer price index. Its base is 1995. The change in US producer price index (PPI), also with a base of 1995, is used as the index of foreign inflation. The real exchange rate is calculated as the nominal exchange rate multiplied by the ratio of the US PPI to the Zambian CPI. Foreign aid is taken as the U.S. dollar amounts reported as Official Development Assistance.

3. The Model

The model has four equations that explain the growth in real income, the growth of investment, the rate of change of the exchange rate, and the rate of inflation. Each equation is structured in the following ways.

The growth equation reflects the conventional determinants of long run economic expansion on the right hand side -- capital accumulation and the growth of labor force. We have used the change in real investment as a proxy for capital accumulation. The coefficients on investment and the labor force are expected to be positive. The change in life expectancy has been included in this equation as an index of human capital that directly reflects the impact of HIV/AIDS. Its coefficient should be positive as well.

Because of Zambia's high degree of aid dependence, we have included foreign aid in the growth equation. Productively used foreign aid should enhance a nation's productive capacity, thereby promoting growth. Thus, the estimated coefficient should be positive. We have also included the real exchange rate. Though this variable is not directly considered a determinant of real income growth, a large and growing body of literature suggests that it should be included.¹⁶⁹ Systematic changes (typically increases) in the real exchange rate (the price of tradables to non-tradables) provide tangible evidence of *effective* economic reform. Recent research on why African countries have been

marginalized in world trade and exchange revealed that the principal reason is the lack of growth rather than the lack of trade.¹⁷⁰ Furthermore, the research is showing that African countries have not been growing because of the gross distortions in their principal relative prices, of which the real exchange rate is the most important. The coefficient estimate on the real exchange rate is expected to be positive.

The equation explaining the growth of investment includes the growth of real income, the growth of the labor force, the change in foreign aid, the dependency ratio, and the change in the real exchange rate. The increase in real income should raise the rate of investment. The growth of the labor force has two separate effects on the growth of investment. An increase in the labor force raises the output of investment goods. However, as the labor force expands, producers can only maintain capital per worker if they raise investment commensurately.

The coefficient on foreign aid is expected to be positive. In principle, the majority of foreign assistance is meant to expand productive capacity. For example, in its 1994 World Development Report, the World Bank highlighted the importance for economic growth of investing in infrastructure. A major focus of foreign aid over the last five decades has been such investment. Yet, there could also be a tenuous link between foreign aid and income growth. External support may support investment activities, but it also frees up domestic resources that may not be used productively. That, of course, has been a major problem in Zambia where for many years, foreign assistance allowed the government to divert its own resources to food subsidies and supporting an over-blown and inefficient public sector.

The equation for the nominal exchange rate has a straightforward specification. It incorporates the idea of purchasing power parity and includes both domestic and foreign inflation as regressors. It also includes real income to measure the impact of overall economic activity on the foreign exchange rate.

The inflation equation is derived from the demand for money. The growth of real income, interpreted as a measure of real supply, is expected to have a negative coefficient. Since rapid changes in the money raise prices, the coefficient on the growth of the money supply should be positive. The exchange rate links the equation to the rest of the system. Lagged inflation is a measure of the speed of price adjustment over time.

4. The Results

The estimated coefficients have been derived using three-stage least squares (3SLS). This generalized instrumental variable technique provides consistent estimates in the presence of lagged dependent variables, endogenous regressors, and error terms that depart from the (normally assumed) white noise disturbances (i.e., independently and identically distributed error terms). Table 1 has the results. The equations are arranged by column. The first column contains the growth equation, the second the investment equation, and so on.

Table 1. 3SLS Estimation Results

Variables		Equation			
		DlnY	DlnINV	DlnE	DlnP
DlnY	Real income growth	-	-0.884 (-1.086)	-0.746 (-0.546)	1.375 (2.161)
DlnINV	Real investment growth	0.023 (1.195)	-	-	-
DlnL	Labor force growth	-0.393 (-1.058)	5.126 (2.107)	-	-
DILIFEX	Change in life expectancy	0.673 (2.216)	-	-	-
DepRatio	Dependency ratio	-	-1.159 (-2.902)	-	-
DlnE	Change in exchange rate	-	-	-	0.256 (1.659)
Dlne	Change in real exchange rate	-0.009 (-0.330)	-0.401 (-2.200)	-	-
DlnM	Growth of money	-	-	-	0.418 (2.100)
DlnP	Inflation rate (domestic)	-	-	0.769 (2.705)	-
DlnPf	Inflation rate (foreign)	-	-	-2.328 (-2.093)	-
DlnAid	Change in foreign aid	-0.026 (-3.010)	-0.003 (-0.041)	-	-
DlnY _{t-1}	Lag of real income growth	0.461 (8.317)	-	-	-
DlnE _{t-1}	Lag of change in exch. Rate	-	-	-0.170 (-0.871)	-
DlnINV _{t-1}	Lag of investment	-	0.443 (6.767)	-	-
DlnP _{t-1}	Lag of (domestic) inflation	-	-	-	0.434 (3.683)
Constant		0.029 (2.657)	1.034 (2.533)	0.191 (1.880)	-0.033 (-0.956)
N	Number of observations	30	30	30	30
"R-sq."		0.79	0.53	0.55	0.83

Note: t-statistics are in parentheses

In the growth equation, investment has the correct sign but is not significant at the standard levels. The growth of the labor force and the change in the real exchange rate have negative coefficients, although neither is statistically significant. Life expectancy shows the expected positive effect on growth.¹⁷¹ The change in foreign aid has a highly statistically significant negative effect on income growth. The highly significant coefficient on income growth is not surprising given Zambia's history. There has been little structural change over the three decades considered and virtually no growth. That is, the current period change in real income departs little from past changes.

In the investment equation, the coefficient estimates for the labor force and dependency ratio have the correct signs (positive and negative respectively) and both are significant at 5 percent. An important result is that neither foreign aid nor the growth in real income appear to have influenced the trend in investment. The change in the real exchange rate was negative and statistically significant. This is contrary to expectations. A depreciation of the real exchange rate should stimulate investment. The outcome could be the result of several contradictory factors. The cost of imported capital rises as the exchange rate depreciates. Real activity is stimulated as the price of tradables and nontradables are realigned. While foreign aid adds to investible resources it also tends to overvalue the real exchange rate. Finally, the coefficient on lagged investment is positive and statistically significant. One implication is that both producers and

consumers have been responding to the incentives of investment in a structured and adaptive way.

In the exchange rate equation, the coefficients of domestic and foreign inflation have the correct signs and are statistically significant. They are, however, statistically different from the values of 1 and -1 , respectively, indicating that the exchange rate deviates from the path consistent with purchasing power parity. The negative and insignificant impact of the real income growth is an anomaly. The expansion of real income should lead to a depreciation of the exchange rate as domestic demand spills over to tradables.

In the inflation equation, the real income has an unexpected positive sign. This result is robust to a variety of model specifications. A potential explanation is that over the last three decades the Zambian economy has been severely distorted and unbalanced. Thus, we should not expect what are ‘equilibrium conditions’ under such conditions. From a policy perspective, the implication is that the distortions and imbalances should be selectively removed. This would restore the correct negative relationship between inflation and real supply. The growth of the money supply has the expected positive effect. As expected, exchange rate depreciation raises the rate of inflation. The coefficient is significant at 10 percent. The lagged inflation term shows that the annual rate of adjustment to changing prices has been sluggish.

For comparison, we present the results from a single equation estimation (ordinary least squares, OLS, estimation with robust standard errors) of the growth equation of the system.

Table 2. OLS Estimation of the Growth Equation

Variable		Coefficient
DlnINV	Real investment growth	0.038 (2.511)
DlnL	Labor force growth	-0.604 (-1.374)
DILIFEX	Change in life expectancy	0.678 (2.516)
Dlne	Change in real exchange rate	-0.022 (-1.834)
DlnAid	Change in foreign aid	-0.027 (-4.192)
Dlny _{t-1}	Lag of real per capita income	0.456 (9.871)
Constant		0.035 (2.621)
N	Number of observations	30
R-sq.		0.81
RMSE		0.02
F		33.71

Notes: t-statistics are given in parentheses

In this instance, the growth of investment has the expected positive coefficient and is statistically significant. The change in the real exchange rate is negative (as it was

earlier) but is now statistically significant. The other estimates are similar to those obtained from the system of equations.

It is worth noting that in both sets of results the estimated regression coefficient on the change in life expectancy at birth is almost identical. This is a robust and important result. It shows that when systemic effects are taken into account and when they are removed, the responsiveness of economic growth to the change in life expectancy does not change. With a coefficient of 0.68, economic growth is significantly responsive to changes in life expectancy. Thus, a one percent reduction in average life expectancy (half a year on average when life expectancy is 50 years) reduces the average growth rate by .68 percent. This is a major source of income loss. Since HIV/AIDS has been a major factor responsible for the sharp reduction in life expectancy at birth over the last decade and a half¹⁷², this supports the contention in the main text that the impact of HIV/AIDS on economic growth is non-linear. The capacity for economic growth in Zambia has been increasingly undermined by the rapid spread of HIV/AIDS.

5. Concluding Comments

The results from our model are highly suggestive. The sharp decline in life expectancy during the latter part of the 1990s in Zambia directly reduced the rate of growth. The change in the dependency ratio also produced a significant reduction in the growth rate of investment. This, in turn, fed back to further reduce the growth of income. Notwithstanding the deterioration of other social indicators, the precipitous drop in life expectancy in Zambia can be attributed, in large part, to the HIV/AIDS epidemic. The implication is that HIV/AIDS has significantly reduced Zambia's rate of growth.

The results also show that shifts in the dependency ratio have had important macroeconomic effects. As noted in the text, there are many potential explanations for the relationships being measured in the model. One of these, reflected in the dependency ratio, is the systematic reduction in the number of workers who are supporting the number of consumers. Seen from an overlapping generations perspective, we would expect growth to decline. The above model is consistent with that outcome. Because investment directly enhances growth, the inference is that the change in the dependency ratio has indirectly reduced growth.

Since the model does not directly connect HIV/AIDS to declining life expectancy, the model does not show conclusively that HIV/AIDS has reduced the rate of growth. Yet, to the extent that there is a connection between HIV/AIDS and falling life expectancy at birth and a rising dependency ratio, the model provides evidence that HIV/AIDS has been undercutting and will continue to undercut the capacity for economic growth in Zambia. For the future, the policy challenge is to ensure that the negative impact on economic growth of HIV/AIDS is minimized.

References

- AIDSCAP (1995) "Private Sector AIDS Policy: African Workplace Profiles."
Washington, D.C.: Family Health International.
- AIDSCAP (1996) *AIDS in Kenya Socioeconomic Impact and Policy Implications*
(Senior editors: S. Forsythe and B. Rau) USAID AIDSCAP/Family Health
International
- Addo, S.K. (1998) "Trickle up micro grants and positive living with HIV/AIDS"
International Conference on AIDS, abstract 24291 [available on
www.healthgate.com/choice/AMA]
- Arrow, K.J. (1974) *the limits of organization* New York: W.W. Norton & Co.
- Barro, R.J. (1997) *Macroeconomics* Cambridge: The MIT Press
- Barro, R.J. (1999) *Determinants of Economic Growth A Cross-Country Empirical
Analysis* Cambridge: The MIT Press
- Beer, C., A. Rose and K. Tout (1988) "AIDS – The Grandmother's Burden"
- Bennell, P. (1996) "Rates of Return to Education: Does the Conventional Pattern Prevail
in Sub-Saharan Africa?" *World Development* Vol. 24, No. 1 (January): 186-199.
- Bollinger, L. and J. Stover (1999) "The Economic Impact of AIDS in Zambia."
Glastonbury, CN: The Futures Group International, September
- Calamitsis, E., A. Basu and D. Ghura (1999) "Adjustment and Growth in Sub-Saharan
Africa" *Working Paper of the International Monetary Fund*
- Carroll, J. (2000) "Stopping Africa's AIDS nightmare" *The Boston Globe* Tuesday,
18th January
- CDC (1998) "AIDS in the Workplace Survey is a Wake-up Call for American
Businesses." Vancouver. [Available at: www.cdc.gov/nchstp/hiv_aids/media]
- Cohen, B. and J. Trussell (eds.) (1996) *Preventing and Mitigating AIDS in Sub-
Saharan Africa: Research and Data Priorities for the Social and Behavioral
Sciences*, Washington D.C.: National Academy Press
- Cohen, D. (1997) "The HIV Epidemic and Sustainable Human Development" UNDP
HIV and Development Programme Issues Paper no. 29
- Cohen, D. (1998) "Poverty and HIV/AIDS in sub-Saharan Africa" UNDP *HIV and
Development Programme* [www.nt1.ids.ac.uk/cgi-bin]
- Collins, J. (1997) "Leveraging Private Sector Support for HIV/AIDS Prevention:
Opportunities and Obstacles. A Report on Zimbabwe and Brazil." Washington,
D.C.: Family Health International/AIDSCAP.
- Commonwealth Secretariat (2000) *HIV/AIDS in the Commonwealth 2000/01* Kensington
Publications Ltd.
- Engels, F. (1845, 1958) *The Condition of the Working Class in England* (Translated
by W.O. Henderson and W.H. Chaloner) Stanford: Stanford University Press
- Essex, Myron (1999) "The New AIDS Epidemic," *Harvard Magazine*
September/October
- Fleming, A.F. et al. eds. (1988) *The Global Impact of AIDS* New York: Alan R. Liss Inc.
FHI=Family Health International, see <http://reservoir.fhi.org/en/gen/corpreport/cr25yrs.html>
- Forsythe, S. and B. Rau, eds.(1996) see AIDSCAP op. Cit.

- Ghura, D. and M.T. Hadjimichael (1996) "Growth in Sub-Saharan Africa" *IMF Staff Papers*, Vol. 43, No. 3, September: 605-634.
- Gillis, M., D. Perkins, M. Roemer and D. Snodgrass (1996) *Economics of Development 4th Edition* New York: W.W. Norton & Company.
- Green, J. (1998) "Employers Learn to Live with AIDS." *HR Magazine* February.
[Available at: www.shrm.org/hrmagazine/articles/0298aids]
- Grindle, M.S. (ed.) (1997) "The Good Government Imperative: Human Resources, Organizations and Institutions" Ch. 1 in (ed.) M.S. Grindle *Getting Good Government: Capacity Building in the Public Sectors of Developing Countries* Cambridge MA: Harvard University Press for the Harvard Institute for International Development
- Grossman, G.M. and E. Helpmann (1995) "Technology and Trade" in (eds.) G.M. Grossman and K. Rogoff *Handbook of International Economics* vol.III, Amsterdam: North Holland
- Hall, J. (1999) "Row Shatters AIDS Complacency." *World*, 19th July,
[Available at: www.bday.co.za/99/0719/world/w13]
- Hayek, F. (1945) "The possibility of social organization" *American Economic Review*...
- Hill, C. and M.F. McPherson (1999) "Economic Growth and Development in Zambia, Further Thoughts on the Way Forward" Report prepared for the Embassy of Sweden, Lukasa, December
- Hirschleifer, J. (1970) *Investment, interest, and capital* Englewood Cliffs: Prentice-Hall
- Hoover, D.A. and M.F. McPherson (1999) "Capacity Building in the Ministry of Finance, Zambia" *HIID Development Discussion Papers* no.704, June
- Hoover, D. and M. McPherson (2000). "HIV/AIDS in the Commonwealth: Capacity Building Programmes – Facing the Reality of HIV/AIDS." London: Commonwealth Secretariat (forthcoming July 2000)
- ING Barings (2000) "The Economic Impact of AIDS in South Africa A Dark Cloud on the Horizon" April
- International Labor Office. (1998) *World Employment Report 1998-99: Employability in the World Economy: How Training Matters*. Geneva: International Labor Office.
- International Labour Organization (1995) *The Impact of HIV/AIDS on the Productive Labour Force in Uganda*, East Africa Multidisciplinary Advisory Team (EAMAT DMT) International Labour Organization, Addis Ababa. Working Paper # 4.
- Johnson, D.Gale (2000) "Population, Food, and Knowledge" *The American Economic Review* vol.90, no.1, pp.1-14
- Kambou, G., S. Devarajan, and M. Over (1992) "The Economic Impact of AIDS in an African Country: Simulations with a Computable General Equilibrium Model of Cameroon" *Journal of African Economies* vol.1, no.1, pp. 109-130
- Kremer, M. (1993) "Population Growth and Technological Change: One Million B.C. to 1990" *Quarterly Journal of Economics* vol.108, no.3, August, pp.681-716
- Lindauer, David. (1981) "Public Sector Employment in Africa: Facts and Concepts." *Studies in Employment and Rural Development* No. 68. Washington, D.C.: World Bank.
- Lindauer, David. (1995) *Labor and the Growth Crisis in Sub-Saharan Africa. Regional Perspectives on World Development Report 1995*. Washington, D.C.: World Bank.

- Loewenson, R. *et al.* (1999) *Best Practices: Company Actions on HIV/AIDS in Southern Africa*, UNAIDS Intercountry Team for Eastern and Southern Africa, Pretoria, February.
- Mankiw, N. Gregory (1997) *Macroeconomics* 3rd Edition New York: Worth Publishers
- McPherson, M.F. and C.F. Zinnes (1992) "Institutional Weakness, Social Norms, and Economic Retrogression" *HIID Development Discussion Paper* no. 223, May
- McPherson, M.F. and T. Rakovski (1998) "Exchange Rates and Economic Growth in Kenya: An Econometric Analysis" *HIID Development Discussion Paper* #651.
- McPherson, M.F. and T. Rakovski (1999) "A Small Econometric Model of the Zambian Economy" *HIID Development Discussion Paper* #672.
- McPherson, M.F. and T. Rakovski (1999a) "Financial Deepening and Investment in Africa: Evidence from Botswana and Mauritius" *HIID Development Discussion Paper* No. 727, October
- McPherson, M.F. and T. Rakovski (2000) "Trade and Growth in Sub-Saharan Africa: Empirical Evidence" revised draft, HIID, Cambridge
- Michael, K. (1999) "Best practices: a review of company activity on HIV/AIDS in South Africa." *AIDS Analysis Africa*, 10(3) October/November
- Michael, K. (1999a) "Unbelievable: AIDS Reporting in the Business Press." *AIDS Analysis Africa*, 10(4) December 1999/January 2000
- Myrdal, G. (1957) *Rich Lands and Poor, the Road to World Prosperity* New York: Harper, chapters 2-5
- National AIDS Fund.(not dated) "Business Case: HIV/AIDS Awareness." Online at www.aidsfund.org/business.htm.
- National Business Initiative (1999) *National Business Initiative Annual Report 1998/99* Colorpress, Johannesburg
- Ng, H. (2000) "AIDS in the Media." *Harvard AIDS Review*, Fall 1999/Winter, [Available at: www.hsph.harvard.edu/organi...archive/fallwin99/fallwin99-6]
- Okello, D. and K. Owino (2000) "Report of Conference on Restarting and Sustaining Growth in Kenya Held at Safari Park Nairobi, 26th January, 2000" draft report
- Quatteck, K. (1999) "The Demographic Impact of AIDS on the South African Economy" ING Barings, Johannesburg, 17th December
- Perkins, D.H. (1994) "There are at least three models of Asian Development" *World Development* vol.22, no.4, pp.651-665
- Pissarides, C.A. (1997) "Learning by Trading and the Returns to Human Capital in Developing Countries" *World Bank Economic Review*, vol.11, no.1, January
- Ram, Rati and T. W. Schultz (1979) "Life Span, Health, Savings, and Productivity." *Economic Development and Cultural Change* 27: pp.399-421.
- Rodrik, D. (1998) "Trade Policy and Economic Performance in Sub-Saharan Africa" *NBER Working Paper* No.6562, May.
- Romer, D. (1996) *Advanced Macroeconomics* New York: The McGraw-Hill Companies
- Rosen, S., J.L. Simon, D.M. Thea, and J.R. Vincent. (2000) "Care and Treatment to Extend the Working Lives of HIV-Positive Employees: Calculating the Benefits to Business." *South African Journal of Science* 96(6) pp.300-34.
- Rosen, S., J.R. Vincent, J.L. Simon, G. Singh, D.M. Thea (2000) "A model for assessing the costs of workforce HIV/AIDS." Forthcoming in the extended abstract

- volumes of the XIII International AIDS Conference, Durban, South Africa: 9-14 July, 2000.
- Rugalema, G., with S. Weigang and J. Mbwika.(1999) "HIV/AIDS and the Commercial Agricultural Sector of Kenya", UNDP and FAO.
- Simon, J.L., S. Rosen, A. Whiteside, J. R. Vincent, and D.M. Thea. (2000) "The Response of African Businesses to HIV/AIDS." *HIV/AIDS in the Commonwealth 2000/01* London: Kensington Publications.
- Smart, R. (1999) "HIV/AIDS in the Workplace: Principles, Planning, Policy, Programmes and Project Participation." *AIDS Analysis Africa* 10(1) June/July
- Smith, A. (1776) in Cannan edition (1937) *The Wealth of Nations* New York: The Modern Library.
- Sunday Times* (South Africa) (1997) "How AIDS will hurt SA where it matters most" April 5th [available at: www.btimes.co.za/97/0504/news/news]
- Tarantola, D. (1988) "Global Strategy for the Prevention and Controls of AIDS" in *The Global Impact of AIDS* New York: Alan R. Liss, Inc., pp.207-214
- UNAIDS (1998) "HIV/AIDS and the workplace: forging innovative business responses" Technical update, July
- UNAIDS (1999) *AIDS Epidemic Update*, UNAIDS Joint United Nations Programme on HIV/AIDS, Geneva: UNAIDS/WHO, December
- Wehrwein, P. (1999) "The Economic Impact of AIDS in Africa" *Harvard AIDS Institute*, Fall 1999/Winter 2000 [available at: www.hsph.harvard.edu/hai]
- Whitelaw, K. (2000) "AIDS in the Classroom." *U.S. News*, February 14th, [available at: www.usnews.com/usnews/issue/000214/aids]
- World Bank (1988) *World Development Indicators* Washington, D.C.: Oxford University Press.
- World Bank (1999) *Confronting AIDS: Public Priorities in a Global Epidemic*, World Bank Policy Research Report New York: Oxford University Press
- World Bank (1999a) *Intensifying Action Against HIV/AIDS in Africa: Responding to a Development Crisis* Washington D.C.: The World Bank Africa Region
- World Bank (2000) *Can Africa Inherit the 21st Century* Washington, D.C.: Oxford University Press.
- World Bank (1993) *World Development Report: Investing in Health* Washington D.C.: Oxford University Press
- Zambia, Ministry of Health (1997) *Zambia Demographic and Health Survey 1996, Preliminary Report* Lusaka: Central Statistical Office and Ministry of Health
- Zambia, Government of (1999) *HIV/AIDS in Zambia: Background Projections Impacts Interventions*, Ministry of Health, Central Board of Health, Lusaka, September.

Endnotes

¹ “AIDS: A Crisis in Development” Lecture to celebrate the 25th anniversary of the Harvard Institute for International Development, Askwith Hall, Harvard University, 9th October 1999. There are many examples. Kambou, Devarajan and Over (1992) reported a WHO estimate of the cumulative deaths from AIDS in Africa by 2000 as 5.5 million (p.112). The cumulative total, in fact, will exceed 15 million.

² This is evident from the earliest models from Kambou *et al.* (1992) to ING Barings (2000) both of which (and others) have been cited below.

³ Although he did not develop a formal model of the process, Cohen (1997) summarized the nature of the problem when he noted:

There are many reasons to believe that the effects of HIV will be to reduce total savings, and in so far as these decline there will be less investment, lower incomes, a slower rate of GNP growth, and possibly a lower level of GNP (p.3).

Yet, even Cohen, whose work on the impact of HIV/AIDS has been most perceptive and far-sighted was tempted to offer a guess at the ultimate impact of the disease. In a subsequent article (Cohen 1997), he stated:

The evidence from high prevalence countries in Africa who are experiencing more mature epidemics is that growth rates of GDP may be reduced by 0.5 to 1.0% per annum due to the epidemic. (p.5)

⁴ This does not imply that nothing is being done. Some of the responses are clearly unsustainable. One experiment to improve morale in Uganda involved providing a subsidy equivalent to U.S.\$100 those taking part and then observing their response (Addo 1998). With the number of people in Africa with HIV/AIDS approaching 30 million, such an experiment would cost \$3 billion. That amount of resources for this one aspect of dealing with HIV/AIDS is simply not available. Moreover, one would have to question the effectiveness of such one-off payments.

⁵ This point was echoed by Cohen (1999) whose extensive work on HIV/AIDS over several years led him to conclude:

It needs to be stressed at the outset that much of the applied research on socio-economic causes and consequences of the HIV epidemic in sub-Saharan Africa has yet to be done (p.1).

He continued:

...such research on both the causes and consequences of the epidemic needs to be timely -- ... -- but are generally everywhere under-recognized.

Specific examples of the organizational effects of HIV/AIDS are provided by Hoover and McPherson (1999, 2000) in Zambia and by Okello and Owino (2000) for Kenya. The latter authors noted:

In the Ministry of Agriculture alone some preliminary estimates, though not scientific, suggest that nearly 50% of our workers who have died over the last five years have died of causes which could be related to HIV/AIDS

⁶ For an exposition of the view that Africa was “on the move” see Madavo and Sarbib (1997), Calamitsis (1996), and Camdessus (1997). McPherson and Goldsmith (1998) provide a different perspective.

⁷ Recognizing the caveats attached to the numbers the prevalence of HIV in some countries is high. For instance, Essex (1999) pointed out:

[In Botswana]... and in Zimbabwe, 35 percent to 40 percent of all pregnant women are infected now; in some towns and villages, 50 percent are infected; and in young adults, aged 20 to 30 years, 45 percent to 50 percent are infected nationwide.

A report on Cable News Network on 29th April 2000 focused on a fishing community in western Kenya (Koma Bay) where HIV prevalence among adults is around 70 percent. For Kenya as a whole the prevalence is 15 percent of the adult population.

⁸ As noted in the text, current approaches to the disease are both important and well intentioned. They do not, however, address the questions of replacement of high-level skills, the stabilization of key institutions (such as central banks, revenue departments, ministries of finance and legal affairs, and departments of public administration). In Annex A, Hoover suggests mobilizing retired workers. This paper adds the suggestion that donor agencies should consider major increases in direct technical assistance combined with sharp cuts in the development agendas of all African governments.

⁹ The World Bank has produced numerous studies, of which *Confronting AIDS: Public Priorities in a Global Epidemic* (World Bank 1999) is only one example. International conferences stimulate further outpourings. The recent (July 2000) stimulated a special edition of the *Science* (23rd June, 2000). It also prompted the Commonwealth Secretariat to sponsor approximately 70 studies, a selection of which were compiled in Commonwealth Secretariat (2000). Two of the authors of this essay contributed to that volume (McPherson and Hoover 2000). Under CAER II, USAID has sponsored a number of studies, of which the present study is one.

¹⁰ Over *et al.* 1988; Kambou, Devarajan, and Over 1992

¹¹ The most recent example is the World Bank Policy Research Report “Confronting AIDS: Public Priorities in a Global Epidemic”, Oxford University Press, 1999.

¹² Moore (1999) examines these costs from a company’s perspective.

¹³ Ironically, one study actually suggests a positive economic impact -- that national per capita income may rise in some cases due to the steep decline in population (“Aids and Development” *Indicator SA*, 1998, vol.15, no.3, pp.57-58). Work done at the Botswana Institute for Development Policy Analysis has reached a similar conclusion. The key industries (diamond mining, beef exports, and tourism) are not particularly vulnerable to the loss of labor. (Personal communication with BIDPA researchers in March 1999.)

¹⁴ BBC website (www.bbc.new.co.uk) “AIDS statistics likely to be conservative” 14th September, 1999

¹⁵ Hoover and McPherson 2000

¹⁶ Loewenson *et al.* 1999

¹⁷ Dr. Samuel Johnson is well known for observing that nothing concentrates the mind as the prospect of being hanged in the morning. The implication, however, is that if the person were not hanged, they would have a “full life” ahead of them. That does not hold for those who are HIV-positive. The question then arises how will people react who know they have no prospect of a “full life”? What actions are required of others to help them remain “focused” and productive?

¹⁸ Annex A has a number of references. See also Simon *et al.* 2000 and Rosen *et al.* 2000a,b

¹⁹ The reason is the oft-noted logical fallacy of composition. Within any society, a few individuals can change their behavior without having much impact on the majority. Large numbers cannot do the same. As increasing numbers of employers shift the costs to families and the rest of society, the pressures on existing health facilities will increase. Resources will be diverted from both private and public sources to begin meeting the additional demand. This diversion of resources will reduce real effective demand and lower the public resources available to repair infrastructure and provide other public services. The outcome will be lower demand for the output and higher operating costs for all firms (including those that originally began shifting the costs of HIV-positive workers).

²⁰ Kambou, Devarajan, and Over 1992

²¹ Essex (1999) described the spread of the HIV-1C sub-type as constituting a “new” epidemic in Africa.

²² Giving the keynote speech at the January 2000 conference “Restarting and Sustaining Growth in Kenya” Professor S. Migot Adholla, Permanent Secretary of the Ministry of Agriculture and Rural Development, Government of Kenya, stated:

Over 1 million Kenyans have died of AIDS related illness and we must clearly wake up to the fact that some of the growth projection that we are making today may not be achievable.

²³ This critique can be applied broadly to all with/without studies that are derived from some “base-line” setting. For example, ING Barings has supported some recent work on the impact of HIV/AIDS on the South African economy (Quatteck 1999, ING Barings 2000). At best, both are examples of potential trends in the course of HIV/AIDS in South Africa *if* one assumes that the epidemic has no further impact on the structure of the economy from this point on. One of our main arguments in this paper is that particular assumption is invalid.

²⁴ This is not a criticism of the actual computations made by Kambou *et al.* Based on the information they had at the time, Cameroon would experience a loss of 30,000 workers. This did not represent a major structural shift. In this respect, it is worth noting that the HIV/AIDS epidemic, though devastating, has only been of major economic significance for a decade or so. The WHO launched its Global Programme on AIDS in 1st February 1987 (Tarantola 1988). By 1988, the generally accepted estimates of the number infected world-wide was 60 thousand. One-third of these were in the United States where 25,000 people had died from the disease (Fleming 1988).

²⁵ *Sunday Times*, 5th April, 1997 A more recent ING Barings report (April 2000), noted below, suggested that the loss of growth in 2006 when the HIV/AIDS epidemic was expected to peak in South Africa would reduce average growth by .3 to .4 percent per year. This estimate was reported in the coverage by *Le Monde* of the Durban conference on HIV/AIDS in July 2000.

²⁶ Evidence of this point is widespread and recent (*Boston Globe* October 1999 “AIDS and the African: The Official Silence”; Swarns 2000; Carroll 2000; Cable News Network 29th April 2000 report on Koma Bay in Kenya.) Many earlier references could be cited as well (Forsythe and Rau 1996; World Bank 1999). The CNN report on AIDS in Kenya on 29th April 2000, noted that President Moi only “went public” about HIV/AIDS in 1999.

²⁷ The prevalence of HIV/AIDS in the population 15-49 in 1997 was 12.9 percent (World Bank 1999, Statistical Appendix Table 4). The ING Barings (2000) study gives the prevalence as 16 percent of the adult population. Recent work by a team led by Jon Simon at Harvard University in South Africa indicates that the prevalence is significantly higher than this (personal communication with Simon).

²⁸ Clear exceptions to this were President Sir Dawda Jawara of The Gambia and President Abdou Diouf of Senegal. Both leaders were convinced during the early stages of the epidemic (the former by researchers at the Medical Research Council in Fajara, the latter by researchers from the Pasteur Institute in Dakar) that public policy had to address the problem. As early as 1985, The Gambia had a public awareness campaign to combat the spread of HIV. Senegal’s campaign drew in the media and local pop artists to advertise the importance of safe sex. The success of both efforts has been reflected in rates of HIV/AIDS that are orders of magnitude lower than what is being experienced across Southern Africa.

²⁹ This, however, is not a new problem. In *The Conditions of the Working Class in Manchester 1845* Frederick Engels introduced the concept of “social murder” (Engels tr. Henderson and Chaloner, p.32). Engels was particularly exercised about social policies that generated and sustained such degrees of abject poverty that it resulted in significant numbers of death through starvation and disease. This idea clearly carries over to the policies (implicit and explicit) which prevented African leaders, especially in Southern Africa, from addressing the problem of AIDS much earlier.

³⁰ World Bank 1999, pp.44 ff, Ch.6

³¹ *HIV/AIDS in Zambia* (Ministry of Health, Lusaka), September 1999, pp.37,57. In this case, lack of knowledge can be no defense. In a demographic and health survey commenced in August 1995, survey workers found that there was almost complete knowledge of AIDS and its impact. Of men survey, knowledge of AIDS exceeded 97.8 percent in every category. For women it was above 98.1 percent in every category including those who had no formal education (Zambia, Ministry of Health 1997, pp. 22-23).

³² This did not prevent *The Boston Globe* excoriating Chiluba for his absence from the conference in its series “Aids and the African” 12th October 1999.

³³ The author was recently in Kenya (April 2000) and had the opportunity to review the government’s “Interim Poverty Reduction Strategy Paper 2000-2003” (Government of Kenya 2000). It was apparent from discussions with government officials that the principal motivation for formulating the poverty reduction strategy was to induce the donors to begin providing aid. On its own terms the poverty reduction strategy was far too ambitious given the capacity of the GOK.

³⁴ World Bank 1999, Ch.6

³⁵ This issue is discussed in more detail in McPherson (1998, 1999).

³⁶ McPherson and Zinnes 1991, 1992

³⁷ Kuznets 1966; Chenery and Syrquin 1975; Syrquin and Chenery 1989

³⁸ From the first empirical studies undertaken by Colin Clark, the decline in the relative share in GDP of agriculture had been taken as both a symbol and index of “development.” Agricultural economists (e.g. Schultz 1957) were concerned when the income share dropped much more rapidly than the share of the work force. In developed countries this posed a ‘farm problem’, where “too much” labor was retained in agriculture. In developing countries, the problem was typically a ‘food problem’ where, despite large amounts of labor in agriculture, productivity was so low that output was inadequate to support improved supplies of food and fiber. In Zambia’s case, this had not occurred because of a decline in the rate of growth, but through a collapse in the growth process. The per capita contribution of agriculture to national income had fallen more slowly than per capita income in the non-agricultural sector.

³⁹ Though even with drought, there have been many ‘endogenous’ responses such as macro water harvesting and reforestation in Morocco and Burkina Faso, tidal irrigation in several West African countries, the switch to more drought resistant crops in Mali, Senegal, and Sudan, and the abandonment of drought-sensitive activities such as maize in The Gambia and cattle grazing in Mauritania that represent an internal adaptation to changing weather pattern. Glantz (1989) also pointed to internal changes in response to drought such as the build up of buffer stocks and the inclusion of more weather-induced fluctuations in public planning.

⁴⁰ This is equivalent to a rise in the rate of discount attached to future benefits.

⁴¹ There is now considerable evidence showing that the rate of spread of HIV falls significantly if other sexually transmitted diseases are treated.

⁴² Hoover and McPherson 2000

⁴³ The basic references are Romer (1986) and Lucas (1988). Expositions may be found Romer (1996, Ch.3), Mankiw (1997, Ch.4), Barro (1998, Ch.11).

⁴⁴ Arrow 1962

⁴⁵ Hyami and Ruttan 1971

⁴⁶ Kremer 1993; Johnson 2000. Johnson argued that since the supply of natural resources on the Earth has been given, the only ‘real’ source of economic growth and development since mankind evolved has been our collective increase in knowledge-based means of manipulating that given supply or both fixed and reproducible resources.

⁴⁷ Pissarides 1997. The essence of his argument is that, because of the size of the world market relative to domestic market opportunities, entrepreneurs in developing countries experience a quantum shift in their efficiency through the education they obtain by having to compete and trade. Because of inter-industry linkages the spillover effects raise productivity in the non-tradable sector.

⁴⁸ Viewed in terms of the “Australian model” of internal and external equilibrium (Gillis *et al.* 1996, Ch.20), a highly distorted economy is well within its production possibility frontier (linking tradables and non-tradables). Economic reform can produce sharp increases in output as the economy moves “outward” towards the frontier.

⁴⁹ Adam Smith 1776, Cannon edition 1937, Ch.2

⁵⁰ Myrdal 1957, Chs. 2-5

⁵¹ This has been well documented in a broad-based study entitled “Restarting and Sustaining Growth and Development in Africa” conducted under the USAID-funded Equity and Growth through Economic Research (EAGER) project. The basic approach taken in that research is described in Duesenberry, Goldsmith, and McPherson (1999). An important conclusion of the study derived from wide-ranging comparative analysis and several African case studies is that reform cannot be sustained if African countries continue to overload their development agendas. The degree to which the spread of HIV/AIDS has undercut “state capacity” simply reinforces that point.

⁵² Taken together these two countries comprise more than half the GDP of SSA. They have been excluded because they have received negligible amounts of foreign aid.

⁵³ Elsewhere, McPherson argues that one of the reasons African countries have declined so dramatically is because of the large, agenda-overwhelming flows of foreign aid. This view is not widely accepted especially among members of the foreign assistance community where foreign aid has been seen as having many positive effects if only African countries would adopt the appropriate policies (World Bank 1998). My argument is that many African countries have been discouraged from adopting appropriate policies because aid has been so large. The issues are debated in McPherson and Gray (2000).

⁵⁴ Johnson 1964

⁵⁵ The minimal fallback is United States (or some other large country) treasury bills and bonds. Investors willing to take more risk can purchase stock index funds, bond funds, or some other highly liquid instrument.

⁵⁶ An accessible source is Hirschliefer (1970). See also Mankiw (1997, Ch.17).

⁵⁷ Mankiw 1997, pp. 420-425

⁵⁸ Although the point is not emphasized here, the spread of HIV/AIDS reduces the willingness of surplus holders (whether individuals or organizations) to lend. The reduction in expected working lives reduces the prospects that borrowed resources will be repaid. In this way, the spread of HIV/AIDS undermines established (or, in developing countries, emerging) credit markets.

-
- ⁵⁹ The two studies on Zambia, cited earlier, suggest that at the present time there are already 500,000 AIDS-related orphans in Zambia out of a population of around 10 million. By the year 2014, that total is expected to increase to 1 million out of a projected population of 12 million (*loc. cit.*, p. 35).
- ⁶⁰ To repeat a point made elsewhere, one of the major challenges that has not been adequately addressed is dealing with the effects of HIV/AIDS has been to devise novel approaches to training. Adapting new technology in ways that raises productivity as the supply of skilled workers declines is one such challenge.
- ⁶¹ The modest reversal in the growth of per capita real incomes, emphasized by Madavo and Sarbib (1997), resulted from improvements in weather and some of the spillover effect of economic liberalization. Those gains, however, have not been sustained (*World Economic Outlook* Spring 2000, Statistical Appendix, Table 5; *World Development Indicators* CD-ROM 2000).
- ⁶² Schultz 1957, Ch.13
- ⁶³ Makiw 1997, pp. 134-135
- ⁶⁴ Whether workers pay for the training through lower initial wages (as Becker and others have argued GET *Economist* reference), is not crucial. According to efficiency wage theory, the wage adjusted for training costs will be higher than earnings in comparable activities.
- ⁶⁵ In the absence of universal HIV testing, employers face a major ‘signaling’ problem. The outcome, well known since Akerlof’s work on “lemons” (i.e., defective products), is that employees will have an incentive to pay at rates reflecting average productivity. This will over-value workers with HIV/AIDS and undervalue those without. The outcome will be a reduction in morale and efficiency.
- ⁶⁶ Hill and McPherson 1999
- ⁶⁷ Denison 1962; Leveson 1967
- ⁶⁸ Collier 1995; World Bank 1995; Yeats *et al.* 1996, 1997
- ⁶⁹ Rodrik 1998; McPherson and Rakovski 1999
- ⁷⁰ CNN international ran a report on AIDS in Kenya on 29th April 29, 2000. They reported that although the rate of infection nation wide was 15 percent, the incidence of HIV among the adult population in the fishing village of Koba Bay approached 70 percent. The death rate in that community has doubled in the last year.
- ⁷¹ The additional burdens falling on grand parents, particularly grandmothers, were noted early in the epidemic (Beer 1988, pp171-174). Those burdens have become especially heavy in agriculture.
- ⁷² Hoover and McPherson 1999, 2000. During a visit to Lusaka in January 2000, McPherson discussed the problem of HIV/AIDS with senior ministry of finance officials. None wished to be quoted but they agreed that the epidemic had seriously disrupted the work of the ministry of finance, the central bank, and many other parts of the government with which the ministry of finance had to deal.
- ⁷³ Arrow 1974, p.33
- ⁷⁴ Arrow 1974, p.33 This point has earlier echoes in the work of Hayek (1945) and Arrow (1952). Hayek pointed out that for the price mechanism to function efficiently there has to be a pooling of information among a wide range of participants. Arrow asked that in a competitive market where everyone takes prices as given, who makes a decision on price? Both observations are fundamental to the operation of modern economies. The spread of HIV/AIDS has been so disrupt of efficiency and growth precisely because it has undermined the basis of established collective action.

⁷⁵ Arrow 1974, p.59

⁷⁶ We have used the same approach adopted in McPherson and Rakovski (1999).

⁷⁷ McPherson and Rakovski (1998, 1999a, b) draw on the model developed by Khan and Knight (1991) to estimate small simultaneous systems for Kenya, Zambia, and Ethiopia. McPherson and Rakovski (2000) have also estimated a simultaneous equations model for 39 countries over the period 1970 to 1998. HIV/AIDS related variables could be inserted in this system to measure the impact of the epidemic on growth.

⁷⁸ This conclusion is evident in Hill and McPherson (1999).

⁷⁹ This point is developed at length in the forthcoming volume by Duesenberry, Goldsmith, Gray and McPherson entitled *Restarting and Sustaining Growth and Development in Africa*. This volume contains a collection of studies (some of which have been published over the last two years) that have been completed under the USAID-funded Equity and Growth through Economic Research (EAGER) project.

⁸⁰ My colleague, Professor Dwight Perkins, has been making this point for many years. Asian countries he has noted (Perkins 1994) did not attempt to leapfrog the development process by cluttering up their development agendas. So far, that message has been missed. It will continue to be missed while the World Bank continues to hustle its “comprehensive development framework” and the IMF persists with its “poverty reduction and growth” strategies. Both seriously misinterpret the capacity of African governments to implement the programs they adopt despite their formal commitments to do so.

⁸¹ A critical lesson that African countries (except Botswana) have not yet learned from the Asian experience is the over-riding importance of a dynamic, expanding agricultural sector. Although the point has been made in many different ways over long periods (World Bank 1981, 1990; Lele 1981; Eicher and Baker 1982; Mellor 1998), African governments have persistently failed to grasp its implications. Those are that there can be no long-term sustained development in Africa while food security remains an issue.

⁸² Two recent examples are the advanced copy of the World Development Report 2000/01 that was released on the World Bank’s web site and the latest report (number six since 1981) on Africa. This former is a collection of impressions and observations lacking a coherent core. Ostensibly aimed at the reducing poverty, the narrative skirts around the principal requirement, namely that if poor countries want to become rich they have to promote and sustain economic growth whatever the temptations and inducements may be to focus on other objectives. The latter study asks whether “Africa can inherit the 21st century?” (World Bank 2000). The uncertain tone is a long way from that of the first study in the series, the so-called Berg Report entitled “Accelerated Development in Sub-Saharan Africa: An Agenda for Action.”

⁸³ The main problem with the IMF in this regard is that its staff has no fundamental commitment to reducing poverty. They are bankers whose strength is that they focus about financial accounts and the prudent use of money and credit.

⁸⁴ Available on www.pub.whitehouse.gov/uri-res/.../1993/1/21/1.text.1

⁸⁵ *The Economist* 13th May, 2000

⁸⁶ Quick Print, Botswana, for example, keeps no medical records. (AIDSCAP, p.22)

⁸⁷ AIDSCAP, p.29.

⁸⁸ AIDSCAP, p.14.

⁸⁹ Carroll (2000) quoted Kofi Annan, Secretary-General of the United Nations, that there is a need to “smash the wall of silence and stigma surrounding” HIV/AIDS. The Boston Globe (October 1999) devoted one of its four sections on HIV/AIDS in Africa to the problems created by “official silence” about the disease.

⁹⁰ James Hall (*World*) reports the outrage expressed by Swazi workers at Fridge Master, a large manufacturing concern, when management publicly announced company statistics on AIDS and HIV infections. He also reports that the “Swaziland Federation of Labour said that AIDS talk would deter foreign direct investment.” The threat to investment is also raised by Ng (*Harvard Aids Review*).

⁹¹ “Private Sector AIDS Policy: African Workplace Profiles”, Washington, D.C., Family Health International, 1995., pp. 8-12.

⁹² ILO, chapter.5.1.

⁹³ National Business Initiative Annual Report, 1998/99, p.1.

⁹⁴ See the 1997/98 and 1998/99 Annual Reports. A similar situation is found with Zimbabwe’s Partners for Growth, a network of chief executives of the country’s leading companies, dedicated to promoting economic growth and prosperity. The organization’s director has noted that the topic of HIV/AIDS has never been raised. (Collins, p.14)

⁹⁵ Essex , 1999

⁹⁶ For example, Essex noted:

[In Botswana]... and in Zimbabwe, 35 percent to 40 percent of all pregnant women are infected now; in some towns and villages, 50 percent are infected; and in young adults, aged 20 to 30 years, 45 percent to 50 percent are infected nationwide.

⁹⁷ This characterization of companies’ responses to HIV/AIDS is found in Simon, etc., p.7.

⁹⁸ Collins, p.10, and AIDSCAP, p.20.

⁹⁹ Collins, p.13.

¹⁰⁰ Collins, p.10.

¹⁰¹ Collins, p.8.

¹⁰² UNAIDS, p.3.

¹⁰³ Collins, p.8, 10, 18

¹⁰⁴ AIDSCAP, pp. 71 and 74.

¹⁰⁵ Rugalema, p.48.

¹⁰⁶ World Bank (1999, p 40.) raises the issue of powerlessness of women which hinders them from taking precautions (such as insisting their husbands use condoms) to prevent infection.

¹⁰⁷ Deizgn Incorporated (Deadly Dezigns), Zimbabwe.

¹⁰⁸ The booklet is entitled, “AIDS: Toward a Greater Understanding”.

-
- ¹⁰⁹ Examples include: the Botswana Meat Commission (AIDSCAP, p.16-17); Rio Tinto, Zimbabwe (AIDSCAP, p.73); and Eastern Highlands Plantations, Zimbabwe (AIDSCAP, p.69).
- ¹¹⁰ UNAIDS/WHO, p.18.
- ¹¹¹ Collins, p.17
- ¹¹² Harmony Gold Mining offers prophylactic treatment of sexually transmitted diseases to commercial sex workers in the mining community. (Michael, 1999, p.5).
- ¹¹³ Sanachem, South Africa.
- ¹¹⁴ Loewenson, *et al.*, p.27.
- ¹¹⁵ Bollinger, p.11.
- ¹¹⁶ Collins page 9 made special note of Triangle Ltd., and the Commercial Farmers' Union in Zimbabwe.
- ¹¹⁷ UNAIDS/WHO, p.19.
- ¹¹⁸ Rugalema, *et al.*, p.44.
- ¹¹⁹ ILO, p.3.4.2.
- ¹²⁰ Michael, Karen. "*Unbelievable: AIDS Reporting in the Business Press*," p.7
- ¹²¹ ILO, p. 3.4.2
- ¹²² ILO, p.3.4.2.
- ¹²³ Collins, p.7, and Rugalema, *et al.*, p.43.
- ¹²⁴ ILO, p. 3.2.1.
- ¹²⁵ AIDSCAP, p.21.
- ¹²⁶ Rugalema, *et al.*, p.43.
- ¹²⁷ Collins p.12
- ¹²⁸ Collins, p.13
- ¹²⁹ Simon, p.8
- ¹³⁰ Collins, p.12
- ¹³¹ Collins, p.12
- ¹³² Rugalema, *et al.*, p.44.
- ¹³³ One of the reasons given for making this change was to support the formation of a black entrepreneurial class. However, it is clearly no coincidence that truck drivers are one of the highest-risk groups for AIDS.
- ¹³⁴ UNAIDS, p.18, and Rugalema, *et al.*, p. 44.

¹³⁵ ILO, p.3.4.6, and Collins, p.7.

¹³⁶ Collins, p.13.

¹³⁷ Collins, p.13.

¹³⁸ *Sunday Times*,(SA).

¹³⁹ Delta Corporation, Zimbabwe (Loewensen, p.69), and *Sunday Times*, (SA).

¹⁴⁰ Whitelaw, "AIDS in the Classroom."

¹⁴¹ UNAIDS/WHO, p.18.

¹⁴² For example, at Delta Corporation, First National Bank of Botswana Ltd., and Kgalagadi Breweries (Pty) Ltd., Loewensen, pp.70, 75, 79.

¹⁴³ See Loewensen, pp. 65-80.

¹⁴⁴ For example, Kgalagadi Breweries (Pty) Ltd., Loewensen, p.79.

¹⁴⁵ Barclays Bank in Zambia has a special, generous termination package that is negotiated with employees who decide they can no longer contribute to the work of the firm.

¹⁴⁶ UNAIDS/WHO, p.19.

¹⁴⁷ See examples in Loewensen, pp.51-62, 105-6.

¹⁴⁸ Collins, p.14.

¹⁴⁹ Botswana Meat Commission, AIDSCAP, p.17.

¹⁵⁰ The SADC Summit in 1997 endorsed a Code on HIV/AIDS and Employment, to guide employers, employees and governments on the most effective, economically sustainable and humane ways to respond to HIV/AIDS in the workplace. Many SADC countries also have national codes or guidelines on HIV/AIDS and employment.

¹⁵¹ Smart, p.5.

¹⁵² Although this is an important point for companies that employ numerous illiterate workers, it has only been mentioned in the case of Africa Beverage Co., Southern Africa (AIDSCAP, p.50).

¹⁵³ World Bank Policy Research Report, pp.77-85.

¹⁵⁴ Simon, p.8, and ILO, 3.4.2.

¹⁵⁵ Hoover and McPherson 2000

¹⁵⁶ This is true even in the literature. Note especially the two World Bank references and the Kenyan study by Forsythe and Rau, published by Family Health International, AIDSCAP, and USAID.

¹⁵⁷ Lindauer 1995

¹⁵⁸ Lindauer 1981

-
- ¹⁵⁹ Lindauer 1995
- ¹⁶⁰ ILO 1998
- ¹⁶¹ UNAIDS 1999
- ¹⁶² Bennell 1996
- ¹⁶³ Ram and Schultz 1979
- ¹⁶⁴ Rosen, Vincent *et al.* 2000
- ¹⁶⁵ See McPherson and Rakovski (1999). That model focused on the key elements in the financial programming framework used by the International Monetary Fund. It was based on the model presented in Khan and Knight (1982).
- ¹⁶⁶ *World Development Report* 1993, Ch. 1.; Gillis *et al.* 1996, Ch.11
- ¹⁶⁷ Indeed, Zambia was one of the few countries in the world where infant mortality and under-5 mortality had increased during the 1980s and 1990s (*World Development Indicators* 1998, Table 2.17, p.106).
- ¹⁶⁸ McPherson and Rakovski 1999
- ¹⁶⁹ Gillis *et al.* 1996: Chapter 20; Ghura and Hadjimichael 1996; Calamitsis, Basu and Ghura 1999; McPherson and Rakovski 2000
- ¹⁷⁰ Rodrik 1998; McPherson and Rakovski 1999a, 2000
- ¹⁷¹ Missing from our analysis is any test for reverse causality. This would require an equation for life expectancy. This aspect can be examined in subsequent research.
- ¹⁷² In Zambia, life expectancy at birth peaked at 51.2 years in 1982. It declined to 49.6 years in 1987. By 1992, it had fallen to 48.4 years. By 1998, it was 43 years.